

*Materials for a Flora of the Malayan Peninsula*.—By GEORGE KING, M.B., LL.D., F.R.S., C.I.E., *Superintendent of the Royal Botanic Garden, Calcutta*.

## No. 7.

In working out the difficult family of *Meliaceæ*, I have had the great advantage of being able to consult a suite of the specimens of Blume and Miquel, which were kindly lent to me, for the purposes of comparison and study, by Drs. Suringar and Boerlage, of the Leiden Herbarium. Many specimens, chiefly of Bornean species, were, through the kindness of its Director, Mr. W. T. Thiselton Dyer, F.R.S., also lent to me from the Kew Herbarium, some of which were enriched by notes by Dr. O. Stapf, a member of the staff of that Institution.

ORDER XXVII. *Meliaceæ*.

Trees or shrubs. *Leaves* alternate, exstipulate, usually pinnate, rarely simple or bipinnate; leaflets opposite or alternate, usually quite entire and more or less oblique at the base. *Flowers* hermaphrodite or polygamo-diœcious, regular, usually in axillary panicles. *Calyx* 3-6-lobed, sometimes entire or with free sepals, usually imbricated in bud. *Petals* 3-6, free or rarely connate at the base, sometimes adhering to the lower half of the staminal tube, valvate or imbricated. *Stamens* 3-12, inserted outside the base of the hypogynous disk; filaments connate in a tube or rarely free; anthers erect, usually sessile on the tube, included or exserted, 2-celled, dehiscing longitudinally. *Hypogynous disk* tubular annular or obsolete, free or connate with the ovary. *Ovary* usually free, 2-5-celled; style single, stigma disciform or capitate; ovules 2, rarely more, collateral or superposed, raphe ventral, micropyle superior. *Fruit* capsular, drupaceous or baccate. *Seeds* exalbuminous or sometimes with fleshy albumen, often enclosed in an aril.—DISTRIB. About 700 species, mostly tropical.

## KEY TO THE GENERA.

*Stamens united in a tube.*

\*Cells of ovary with 1 or 2 ovules in each.

Leaflets serrate; fruit drupaceous ... 1. MELIA.

Leaflets entire; fruit baccate or capsular.

Flowers and staminal tube narrow, elongate; style elongate.

Stigmas 5 or 5-toothed; leaves trifoliolate; fruit

baccate ... 2. SANDORICUM.

Stigmas entire, single; leaves pinnate; fruit capsular  
or sub-capsular.

Petals in 2 rows; ovary 7- to 9-celled, with 1 ovule

in each cell; disk short, inferior to ovary 3. MEGAPHYLLÆA.

Petals in a single row; ovary 2-to 4-celled.

Disk short, annular; ovules solitary in the cells

of the ovary ... 4. CHISOCHETON.

Disk cylindric, longer than the ovary; ovules 2

in each cell of the ovary ... 5. DYSOXYLUM.

Flowers and staminal tube globose or turbinate, style  
short or absent.

Anthers included or incurved.

Petals 3; fruit dehiscent or not ... 6. AMOORA.

Petals 5; fruit indehiscent.

Style none ... 7. AGLAIA.

Style short, thick ... 8. LANSIUM.

Anthers exserted, never incurved, only partially united  
into a tube (in two species of *Walsura* not united.)

Petals 5; fruit baccate, indehiscent ... 9. WALSURA.

Petals 4 or 5; fruit capsular, dehiscent 10. HEYNEA.

\*\*Cells of ovary 2- to 8-ovuled; stigma discoid; fruit capsular;

seeds large, fleshy, not winged ... 11. CARAPA.

\*\*\*Cells of ovary with numerous ovules in each; stigma

capitate; fruit capsular; seeds thin, winged 12. CHICKRASSIA.

*Stamens distinct.*

Cells of ovary 8- to 12-ovuled; seeds membranous, winged

13. CEDRELA.

Cells of ovary with 1 or 2 ovules, fruit baccate; seeds not

winged ... 9. WALSURA.

## 1. MELIA, Linn.

Trees with pinnate or 2- 3-pinnate leaves, toothed or entire leaflets and paniced axillary flowers; pubescence often stellate-mealy. *Calyx* short, 5-6 lobed, imbricated. *Petals* 5-6, free, spathulate-oblong, patent,



imbricated in bud. *Staminal-tube* cylindrical, dilated at base and apex, 10- or 12-striate and -toothed; anthers 10 or 12, included or partly exserted, short, inserted near apex. *Disk* annular. *Ovary* 3-6-celled; cells alternate to the sepals when equal in number to them. *Style* slender, nearly as long as the tube, stigma capitate; ovules 2, superposed. *Fruit* drupaceous. *Seeds* with thin fleshy albumen; cotyledons foliaceous. *Distrib.* About 12 species; Indo-Malayan.

Petals concave, obtuse; ripe drupe 1 to 1·5

in. long                   ...                   ...                   ...                   1. *M. composita*.

Petals flat, sub-acute; ripe drupe ·6 to ·7 in.

long   ...                   ...                   ...                   ...                   2. *M. Azedarach*.

1. *MELIA COMPOSITA*, Willd. Sp. Plant. II. 558. A tall tree; young branches rather stout, at first covered with pale loose stellate pubescence, ultimately smooth and of a dark colour. *Leaves* 1 to 2 feet long, bi- or occasionally tri-pinnate, the leaflets on each pinna 5- to 11, petiolulate, from ovate-lanceolate to ovate-rotund, often oblique at the base, acuminate, serrulate or entire; the main nerves 7 or 8 pairs, sub-horizontal, rather distinct on the lower surface; both surfaces sparsely stellate-pubescent when young, ultimately glabrous. *Panicles* shorter than the leaves, pedunculate, spreading, stellate-hairy, many-flowered. *Flowers* ·3 to ·35 in. long. *Calyx lobes* erect, ovate-lanceolate, stellate-tomentose outside, pubescent or glabrous inside, much shorter than the petals. *Petals* linear-spathulate, concave, pubescent externally, puberulous internally. *Staminal tube* nearly as long as the petals, slightly expanded at the 10-toothed mouth; the teeth bifid, silky-puberulous on both surfaces; anthers exserted, pubescent. *Stigma* 5-toothed. *Drupe* ovoid, 1 to 1·5 in. long, smooth, yellowish. *Seeds* one in each cell, smooth, pointed. W. and A. Prod. I. 117. (excl. syn. *M. superba*, Roxb.); Dalz. and Gibs. Fl. Bomb. 36; Thwaites Enum. Pl. Ceyl. 59; Bedd. Fl. Sylvat. t. 12; Brandis For. Flora 69. *M. dubia*, Hiern (not of Cav.) in Hook. fil. Fl. Br. Ind. I, 545; De Cand. Monog. Phan. I. 453; Trimen Flora Ceylon Vol. 1. 243 (exc. from all the syn. *M. superba*, Roxb.). *M. robusta*, Roxb. Hort. Beng. 33; Fl. Ind. II, 397. *M. australasica*, Adr. Juss. in Mem. Mus. XIX, 257. *M. æthiopica* and *M. Bombolo*, Welw. Apontam. Phyto-Geogr. Prov. Angola, 584 and 561. *M. argentea*, Herb. Ham. ex Wall. Cat. 1254 C.

Malacca: Maingay No. 317 (Kew Dist.), and probably in some of the other provinces. *DISTRIB.* Brit. India, Ceylon, Australia, Angola.

This is a widely-spread species, and has received many names. From the synonymy above quoted, I have excluded *M. superba* Roxb., which I believe to be a distinct species, with which the tree named *M. Birmanica* by Kurz (Journ. As. Soc. Bengal, Vol. 43, pt. 2, p. 183;

For. Flora Burm. I, 213) is probably identical. In Roxburgh's original descriptions of *M. superba* and *M. robusta*, he carefully states the differences on which he depends for their separation. These are as follow:—

<i>M. superba.</i>	<i>M. robusta.</i>
<i>Leaves</i> bi- tri-pinnate, 2 to 4 feet long.	<i>Leaves</i> bi-pinnate, 12 to 18 in. long.
<i>Flowers</i> small, dull white, with an offensive smell.	<i>Flowers</i> small, white, inodorous.
<i>Bracts</i> small, lanceolate, caducous.	<i>Bracts</i> solitary, filiform and often very long.
<i>Sepals</i> ovate-lanceolate, incurved, mealy.	<i>Sepals</i> ovate-oblong.
<i>Staminal tube</i> 10-ribbed, hairy inside, each of the ten teeth of the mouth divided into 3 4 or 5 short subulate segments.	<i>Staminal tube</i> with the segments of its mouth minute and filiform.

Specimens of both trees were growing in the Calcutta Garden when Roxburgh described them, the one having been received from Sunda, the other from Malabar. Roxburgh, of whose sagacity and judgment one has a thousand examples, considered them as quite distinct, and it would take a great deal more evidence than has been produced to make me believe that they are conspecific. The Malabar plant (*M. robusta*) is clearly the same as the Ceylon species which has since been identified with *M. composita*, Willd., Sp. Plantar. II 559. I cannot however agree to the view, first put forward by Mr. Hiern, that *M. composita* Willd. should be reduced to *M. dubia*, Cav. Cavanilles describes three species of *Melia*, viz., *M. azedarach*, *azedirachta*, and *dubia*, and he gives figures of the first two, but not of *M. dubia*. He describes flowers of the latter as like those of *M. Azadirachta* in size, the staminal tube as 6-toothed with a possibility of more teeth ("an pluribus?"), and the stigma as peltate. Now, as a matter of fact, the flowers of *M. composita* Willd. are in size and other respects like those of *M. Azidarach*, and not like those of *M. Azadirachta*. The mouth of the staminal tube is many-toothed, and the stigma is ovoid, 5-toothed, and not peltate. Cavanilles' description points to a plant belonging to some other genus than *Melia*, whatever the "original specimen" named *M. dubia* in the Herbarium of the University of Rostock may be; and it is on that specimen which the reduction of *M. composita* to *M. dubia* is based. (See Hiern in Hook. fil. Fl. Br. Ind. I, 545.) No authentic specimen of *M. superba* is, so far as I know, in existence (the specimens issued by Wallich, under this name, being really *M. robusta*, Roxb.). In my opinion *M. superba* Roxb., (the Sunda i.e., Malayan) species, cannot on account of its staminal tube (densely villous internally and with numerous minute teeth at the mouth) be in-



cluded, like *M. robusta*, Roxb., under *M. composita*, Willd. For the teeth of the mouth of the staminal tube of the latter are at most bifid, while its inner surface is nearly glabrous. The only specimens of *Melia* known to me which fits Roxburgh's description in these and other respects, were collected in Burma by the late S. Kurz, and were described by him under the name *M. birmanica*, (Journ. As. Soc. Bengal, 1874, ii. 183; For. Flora Burmah, I, 213). And I know of no other specimens of *M. birmanica* than those of Kurz's collecting. Certainly Maingay's No. 317 (Kew Distrib.) is not the same, as I have determined by dissecting flowers of both. *M. composita*, Willd., is not really very distinct from the Japanese *M. Toosedan*, Sieb. and Zucc., which, in turn, is closely allied to *M. Azadirach*. There are, by the way, in the Calcutta Herbarium, specimens from the Khasia Hills, Munipore, the plains of Assam and also from Sumatra, which, as far as I see, cannot be distinguished from Japanese specimens of *M. Toosedan*. If this identification be correct, the geographical area of the latter species will have to be largely extended.

*M. Azadirachta*, Linn., is not found in the Malayan Provinces even planted. But *M. Azadarach*, Linn., is very common planted. It presents several varieties, some of which have been elevated to the rank of species.

Roxburgh describes a Penang plant which he names *Melia tomentosa*. Of this no specimen is known now to exist. But he left an excellent coloured drawing of it in the Calcutta Herbarium, which shows it to be no *Melia* but a *Chisocheton*. Jack describes (Malayan Miscellanies I, 12) a Penang species which he named *Melia excelsa*. The only specimens known of this are what Wallich issued (under this name) as No. 1253 b. of his catalogue. The only Wallichian specimens of this which I have seen are without flowers: they have simple long pinnate leaves, and their *facies* is not that of *Melia* but of some other genus.

2. MELIA AZIDARACH, Linn. Sp. Pl. ed. I., 384. A small tree; young branches rather slender, at first scurfy-puberulous, afterwards dark-coloured and glabrous. *Leaves* 1·5 to 2 feet long, bi-pinnate, glabrous when adult; pinnæ about 3 pairs, the uppermost often 3-foliolate; pinnulæ 5 to 7, opposite or sub-opposite, obliquely ovate or oblong-ovate, acuminate, shortly petiolulate, 1·5 to 2 in. long, when young coarsely serrate, when adult serrulate or sub-entire. *Panicles* shorter than the leaves, shortly pedunculate, spreading, lax, few-flowered, at first stellate-puberulous but ultimately glabrous. *Flowers* ·35 in. long. *Calyx-lobes* oblong-lanceolate, pubescent. *Petals* flat, oblanceolate-spathulate, puberulous. *Staminal tube* lilac, expanding at the 30-toothed mouth, glabrous

outside, sparingly pubescent inside. *Style* clavate at the apex; *stigma* 10-lobed. *Drupe* oblong, smooth yellowish, .6 or .7 in. long. Linn. Hort. Cliff. 161; Cav. Diss. 7 t. 393, p. 207; Roxb. Hort. Beng. 33; Fl. Ind. ii. 395; Wight Ic. t. 160; Wall. Cat. 1250; DC. Prod. i, 621, Boiss. Fl. Orient. i. 954; W. & A. Prodr. i. 117; Adr. Juss. in Mém. Mus. xix. t. 13, f. 4; Bot. Mag. t. 1066; Bedd. Fl. Sylvat. t. 13; Brandis For. Flor. 68; Miq. Fl. Ind. Bat. I, Pt. 2, p. 533; Ann. Mus. Lugd. Bat. V. 5; Kurz For. Flora Burmah. I, 212; Hiern in Hook. fil. Fl. Br. Ind. I, 544; C. DC. Monog. Phan. I, 451. *M. sempervirens*, Sw. Prodr. 67; Bot. Reg. t. 643; Roxb. Hort. Beng. 33; Fl. Ind. ii. 395; Wall. Cat. 1252; Dalz. & Gibs. Bomb. Fl. Suppl. 15. *M. Bukayun*, Royle Ill. Bot. 144; Griff. Itin. Notes 355, 403.

Planted in most of the Provinces, and in all the warmer parts of both the Old and New Worlds.

## 2. SANODRICUM, Cav.

Trees with trifoliate, coriaceous, entire leaflets, the lateral with a short, the terminal with a long petiolule. *Flowers* pentamerous with imbricate æstivation, in axillary panicles. *Calyx* cup-shaped, its tube adnate to the base of the ovary, its lobes short. *Petals* free, oblong, obtuse. *Staminal tube* cylindric, nearly as long as the petals, the mouth 10-toothed. *Anthers* 10 or 8, included. *Disk* tubular, embracing the ovary and base of the style. *Ovary* immersed in the calyx-tube, narrowed upwards into the columnar style, 5-celled, each cell with 2 collateral pendulous ovules. *Style* clavate at the apex. *Stigmas* 5, erect, sub-cylindric, fleshy, each surrounded at the base by a fleshy ring. *Berry* superior, sub-globular, fleshy, indehiscent, 3·5-celled, and with as many arillate seeds; the aril papery outside, pulpy inside. **DISTRIB:** About seven species—all Indo-Malayan.

Stigmas united, radiating, their apices re-curved

... 1. *S. radiatum*.

Stigmas distinct, erect, sub-cylindric.

Staminal tube cylindric, ventricose in

the upper half ... 2. *S. Maingayi*.

Staminal tube cylindric, not ventricose.

Leaflets emarginate ... 3. *S. emarginatum*.

Leaflets more or less acuminate ... 4. *S. indicum*.

1. **SANDORICUM RADIATUM**, King, n. sp. A tree 40 to 80 feet high. *Leaves* 6 to 12 in. long; leaflets sub-coriaceous, broadly ovate, sub-oblique, acute or shortly acuminate, the base slightly cuneate; upper surface glabrescent or glabrous, the lower pubescent on the midrib and 8 to 10 pairs of spreading sub-prominent nerves; length 3 to 6 in.,



breadth 1.75 to 4 in.; petiolules .2 to .5 in., the terminal one 1.5 to 2.5 in. *Panicles* with few short branches, slender, 3 to 5 in. long, few-flowered, lax. *Flowers* .25 in. long; the pedicels about as long, slender, puberulous. *Calyx* cupular, less than half as long as the petals, with 5 shallow broad sub-acute teeth, puberulous. *Petals* narrowly elliptic, longer than the staminal tube. *Staminal tube* cylindric, not ventricose, ridged, glabrous, its mouth with ten subulately bifid teeth: anthers ovate with broad bases, included. *Ovary* cylindric, tapering into the short style; stigmas radiating, their apices recurved. *Fruit* unknown.

Perak: Wray No. 3345; King's Collector No. 6001. Singapore: Ridley No. 4822.

This differs from the other three species in its stigmas which unite to form a radiate discoid mass, the edges being recurved; while the other three species have erect slender un-united stigmas.

2. *SANDORICUM MAINGAYI*, Hiern in Hook. fl. Fl. Br. Ind. I, 554. A tree. *Leaves* 6 to 8 in. long: leaflets elliptic, sub-glabrous, sub-acuminate, the base obtuse or sub-acute; main nerves 6 to 8 pairs, depressed on the upper, prominent on the lower surface, spreading; length 2 to 5 in., breadth 1.5 to 3 in.; petiolules .35 in., the terminal one 1.25 to 1.75 in. *Panicles* shorter than the leaves, lax, puberulous. *Flowers* .35 to .45 in. long, their pedicels of about the same length; bracteoles minute, subulate. *Calyx* fleshy, obscurely toothed, minutely pilose. *Petals* three times as long as the calyx, fleshy, elliptic, blunt, glabrous. *Staminal-tube* cylindrical, ventricose in the upper half, ridged; the mouth with 10 bifid teeth. *Stigmas* erect, rather long. *Fruit* unknown. C. DeCand. Mem. Phan. I, 462.

Malacca; Maingay (Kew Distrib. No. 328).

I have seen only Maingay's Malacca specimens. They resemble *S. borneense*, Miq., of which I have seen the type specimen; but that species has narrower and longer leaflets with more numerous lateral nerves; it has also smaller flowers.

Mr. Hiern describes this as a tree, M. C. DeCandolle as a shrub.

3. *SANDORICUM EMARGINATUM*, Hiern in Hook. fl. Fl. Br. Ind. I, 553. A tree. *Leaves* 5 to 7 in. long; leaflets obovate to elliptic, the apex emarginate and usually mucronate, slightly narrowed to the oblique base; main nerves 5 to 6 pairs, spreading, slightly prominent; length 2 to 3.5 in., breadth 1.25 to 2 in., petiolules .35 to .5 in., the terminal one 1 to 1.25 in. *Panicles* short, dense; flowers .2 in. long, shortly pedicellate. *Calyx* cup-shaped, slightly accrescent. *Staminal-tube* with 8 or 10 sub-glabrous emarginate teeth. *Fruit* (immature) sub-globular or obovoid, densely and minutely tomentose. C. DeCand. Mem. Phan. I, 461. *S. Beccarianum*, Baill. in Adansonia, 264.

Malacca: Maingay (Kew Distrib. No. 331).

I have seen only Maingay's imperfect specimens of this. The above description is copied chiefly from Hiern.

4. *SANDORICUM INDICUM*, Cav. Diss. VII, p. 359, tt., 202, 203. A tree 30 to 40 feet high. *Leaves* 9 to 18 in. long; leaflets broadly ovate to ovate-rotund, shortly and abruptly acuminate, the base rounded or sub-cuneate, slightly unequal; main nerves 8 to 12 pairs, spreading, impressed on the upper, prominent on the lower surface when dry; upper surface glabrous, lower pubescent or puberulous, becoming glabrescent when old; length 4 to 8 in., breadth 2 to 4.75 in.; lateral petiolules 3 to 4 in., terminal 2 to 3 in. *Panicles* several, scattered near the apices of the branches, only a few inches long, few-flowered, minutely rusty-tomentose. *Flowers* .4 or .5 in. long; pedicels .25 in., pubescent. *Calyx* minutely tomentose. *Petals* linear-elliptic, obtuse, fleshy, glabrous. *Staminal tube* narrow, fleshy, striate, glabrescent outside and puberulous inside. *Fruit* sub-globose, obtusely 5-angled at least when young, densely but minutely pubescent, 1.5 to 2 in. in diam., filled with a yellowish acid edible pulp; arillus with many spongy woody fibres; seed brown, glossy. W. & A. Prodr. i. 120; Blume Bijdr. I. 163; Adr. Jus. in Mem. Mus. xix. t. 16, f. 15; Hassk. Retzia, i. 146; Roxb. Cor. Pl. iii. 58, t. 261; Fl. Ind. ii. 392; Wall. Cat. 1249; Kurz For. Fl. Burma, I, 217; Heirn in Hook. fil. Fl. Br. Ind. I, 553; De Cand. Mon. Phan. I, 461; Miq. Fl. Ind. Bot. I Pt. 2., p. 541. *Sandoricum nervosum*, Blume Bijdr. I., 165; Miq. in Ann. Mus. Lugd. Bat. IV, 30. *S. ternatum*, Blanco Fl. Filip. ed. i. 346. *S. glaberrimum*, Hassk. Retzia, i. 145. *Trichilia nervosa*, Vahl Symb. i. 31. *Melia Koetjape*, Burm. Fl. Ind. 101. *T. venosa*, Spreng. Syst. iii. 68.

In all the Provinces except the Nicobar Islands. **DISTRIB.** Siam; the Malayan Archipelago, Burma.

The fruit of this is edible, and on that account the species is occasionally cultivated.

### 3. *MEGAPHYLLÆA*, Hemsl.

A tree. *Leaves* large, pinnate; leaflets opposite, slightly oblique. *Panicles* extra-axillary, narrow and raceme-like, shorter than the leaves. *Flowers* more than 1 in. across when expanded. *Calyx* cupular, fleshy, sub-persistent, annulate and thickened below the middle; its tube adnate to the base of the ovary, its mouth irregularly 3 to 5-lobed. *Petals* 10, narrowly elliptic, thickly coriaceous, in two rows, free, imbricate. *Staminal-tube* cylindric, its mouth obscurely crenulate; anthers 10, included. *Disk* cushion-shaped, many-lobed. *Ovary* seated on the disk, depressed, 7- to 9-celled; style thick, stigma capitate, ovules one from the central angle of each cell. *Capsule* large, sub-spherical, 7- to



9-lobed, 7- to 9-celled, the pericarp very thick. *Seeds* exalbuminous, compressed, exarillate, glabrous, with large hilum and conferruminate cotyledons.

DISTRIB. A single Malayan species.

MEGAPHYLLÆA PERAKENSIS, Hemsl. in Hook. Ic. Plant. t. 1708. A tree 20 to 40 feet high. *Leaves* when adult 6 or 7 feet long (*fide* Hemsl.), glabrous, the petiole and rachis compressed; leaflets oblong, subcoriaceous, sub-acute; the base oblique, sub-truncate or cuneate; the larger 12 to 15 in. long, 3 to 4 in. broad; petiolules .35 to .75 in.; main nerves 10 to 12 pairs, spreading, curving, slightly prominent beneath. *Panicles* 16 to 20 in. long; the lateral branches short, racemose, few-flowered; the main rachis 4-angled, compressed. *Flower-buds* clavate, narrowed into a pseudo-stalk as long as the pedicel proper. *Flowers* 1 in. long, and about 1.25 in. in diam. when expanded, their pedicels .35 in. long. *Calyx* shortly cylindric, with a thick lobulated ring outside near the thickened base, puberulous outside. *Staminal-tube* shorter than the petals, pubescent inside below the insertion of the anthers, otherwise glabrous. *Anthers* elliptic. *Ovary* and lower half of style minutely tomentose. *Fruit* globular-pyriform, densely but minutely tomentose, about 3 in. in diam.; the pericarp 1 in. thick. *Seeds* 1 in. long.

Perak; at elevations of 3,000 to 4,000 feet, Scortechini, Wray, Curtis, King's Collector.

This genus was placed by its author provisionally next to *Chisoche-ton* to which it is no doubt closely allied, the points in which it chiefly differs from that genus being its two-ranked petals and 7- to 9-celled ovary. I give the length of the leaves as 6 to 7 feet on the authority of Mr. Hemsl. who, in his figure, shows the leaflets as very numerous. None of the Herbarium specimens which I have seen enable me to estimate either the length of the former or the number of the latter.

#### 4. CHISOCHETON, Blume. (*Schizochiton*.)

Trees or shrubs. *Leaves* equally pinnate; leaflets entire, opposite or sub-opposite, more or less oblique. Flowers polygamo-dicæcious, in extra-axillary, rarely axillary, divaricately-branched panicles and numerous; or in spike-like racemes or cymes and few. *Calyx* small, cup-shaped or cylindric, entire or 4-5-toothed. *Petals* 4-5 or more, usually linear-elongate or cylindric, at first cohering in a tube especially below, at length spreading, somewhat imbricated or valvate. *Staminal tube* elongate, slender, tubular, 4 to 12-lobed at the apex, lobes entire or toothed; anthers linear, equal in number to and alternate with the lobes, included or somewhat exserted. *Disk* short and fleshy,

or tubular. Ovary short, 2- 4-celled; style filiform, usually exceeding the staminal tube; stigma capitate or cylindric, usually with a ring at its base; ovules usually one in each cell. Capsule sub-globose, often beaked, thickly coriaceous, 2- 4-celled. Seeds often enclosed in an imperfect aril; cotyledons usually peltate.—DISTRIB. An Indo-Malayan genus of about 22 species.

*Inflorescence only a few inches long, much shorter than the leaves, spike-like, few-flowered; fruit beaked.*

Flowers .5 in. long, narrowly cylindrical  
in bud ... 1. *C. spicatus*.

Flowers .9 in. long, widely cylindrical in  
bud ... 2. *C. pauciflorus*.

*Inflorescence extra-axillary, spike-like, a foot long or upwards, including the peduncle.*

Flowers confined to the terminal two  
inches of the inflorescence, the pedun-  
cles very much longer; flowers .5 or .6  
in. long, 4-merous, cylindric in bud;  
fruit beaked ... 3. *C. Kunstleri*.

Flowers on short lateral branches scattered  
along the rachis of the inflorescence.  
Flowers .75 to .1 in. long, 4- or 5-  
merous, clavate in bud; fruit beaked 4. *C. penduliflorus*.

Flowers 1.25 to 1.5 in. long, cylin-  
dric in bud; petals 7 to 9; fruit  
not beaked ... 5. *C. rubiginosus*.

Flowers on distant lateral glomeruli 1.25  
to 1.5 in. long; petals 5; fruit sub-  
globular, not beaked ... 6. *C. princeps*.

*Inflorescence extra-axillary, paniculate.*

Young shoots, under surfaces of leaves,  
petioles, and inflorescence pubescent or  
tomentose.

Panicles as long as the leaves; flowers  
.25 in. long; petals 4, anthers much  
exserted from staminal tube ... 7. *C. glomeratus*.

Panicles about half as long as the  
leaves; flowers .45 in. long; anthers  
included in staminal tube ... 8. *C. erythrocarpus*.

Rachises of leaves and both surfaces of  
leaflets minutely pubescent; panicles



puberulous; flowers .5 to .6 in. long,  
 their buds very clavate; calyx with an  
 annulus below its teeth ... 9. *C. annulatus*.

Rachises of leaves sub-glabrous; midrib  
 and nerves of leaflets minutely pubescent  
 on the lower surface when young; flow-  
 ers .5 to .6 in. long, cylindric in bud;  
 calyx not annulate ... 10. *C. macrophyllus*.

Leaves everywhere glabrous.

Petals 5; leaflets 2 to 4 pairs;  
 panicles longer than the leaves, much  
 branched; flowers .5 in. long; sta-  
 minal tube truncate with about 14  
 broad shallow teeth ... 11. *C. macrothyrsus*.

Petals 4.

Mouth of staminal tube almost  
 entire, slightly waved; flowers  
 .4 or .5 in. long ... 12. *C. laxiflorus*.

Mouth of staminal tube with 6  
 long lanceolate teeth.

Flowers greenish-white, fœ-  
 tid; fruit pyriform, gla-  
 brous, deep red in colour... 13. *C. patens*.

Flowers yellow, fragrant;  
 fruit turbinate-globular,  
 yellow when ripe ... 14. *C. divergens*.

1. *CHISOCHETON SPICATUS*, Hiern in Hook. fil. Fl. Br. Ind. I, 550. A  
 tree about 30 feet high; young shoots and inflorescence deciduously  
 tawny-tomentose. *Leaves* 8 to 12 in. long, equally pinnate; leaflets  
 2 or 3 pairs, opposite, membranous, oblong-lanceolate to elliptic or  
 ovate, shortly and bluntly acuminate, the base cuneate, slightly obli-  
 que; upper surface quite glabrous, the lower with the nerves and  
 midrib puberulous; main nerves 4 to 6 pairs, curving; length 2.5 to 5  
 in., breadth 1.35 to 2 in., petiolules .25 to .35 in. *Panicles* spike-like,  
 axillary, 2 to 3 in. long, angled, adpressed-pubescent, few-flowered.  
*Flowers* .5 in. long, their pedicels about .1 in., pubescent. *Calyx* deeply  
 cup-shaped, tomentose, the mouth truncate sub-entire or irregularly  
 toothed. *Petals* 5 (sometimes 4?) much larger than the calyx, narrowly  
 elliptic, united by their edges, and densely and minutely adpressed rusty-  
 tomentose outside, glabrous inside. *Staminal tube* nearly as long as  
 the petals, narrowly cylindric, densely adpressed-pubescent outside,  
 the mouth with 5 broad teeth. *Stamens* 5, elongate, narrow, inserted

below the mouth, included. *Ovary* narrowly elliptic; the style long, cylindric; stigma capitate with a large central mamilla. *Fruit* transversely oblong, tapering to each end, the upper end compressed, acute, the lower terete, minutely rusty-tomentose; seeds two, sub-compressed, .5 in. in diam., length (including the tapering ends) nearly 2 in., breadth .75 in. C. DeCand. Mon. Phan. I, 535.

Malacca: Maingay (Kew Distrib.) No 363. Perak: Scortechini.   
DISTRIB: Sumatra, Borneo.

The fruit of this is very peculiar, being in shape something like a spear-head. The central part, in which the two seeds are contained, is transversely-oblong and thick; above this is a long compressed conical prolongation filled with a little pulp, while at the base the fruit is gradually narrowed into a stalk. The sparsely-flowered spike-like inflorescence is also peculiar in the genus.

2. *CHISOCHETON PAUCIFLORUS*, King, n. sp. A shrub or small tree; young shoots slender, puberulous, the bark dark when dry. *Leaves* 5 to 15 in. long, equally pinnate; leaflets thinly coriaceous, 2 rarely 3 pairs, oblanceolate or oblong-lanceolate, sometimes ovate or elliptic, shortly and rather abruptly acuminate, the base cuneate; the upper surface glabrous, shining; the lower dull, glabrescent, reticulate, puberulous on the midrib and nerves; main nerves 5 or 6 pairs, ascending, curving, slightly prominent beneath; length 2.5 to 9 in., breadth 1 to 4 in., petiolules .1 to .2 in. *Panicles or racemes* from 1 to 3.5 in. long, extra-axillary, puberulous, 2- to 6-flowered. *Flowers* about .9 in., long; their pedicels .25 to .5 in., puberulous. *Calyx* fleshy, tubular, the mouth entire and truncate or with 4 or 5 shallow teeth, tomentose, about .25 in. long. *Petals* 4 or usually 6, free, about .8 in. long, fleshy, spathulate-elliptic or elliptic, blunt, minutely tomentose outside, glabrous inside. *Staminal tube* nearly as long as the petals, sub-glabrous, obscurely toothed at the mouth; the anthers from 4 to 8 or 10, varying with the number of petals, small, elliptic, included. Disc small, flat, tomentose. *Ovary* conical, tapering into the long cylindric style, sometimes narrowly cylindric (probably abortive). *Stigma* cylindric, obscurely 4-lobed at the apex. *Fruit* (unripe), elliptic, with a stout acute apical beak, tapered at the base, everywhere tomentose, the calyx persistent and slightly accrescent.

Perak: Scortechini; Wray, No. 2681; King's Collector, Nos. 3128, 3313, 3396, 3467 and 4455.

This species resembles *C. spicatus*, Hiern, in leaves; but has much larger flowers. Its fruit is as yet unknown. This also resembles *C. diversifolius*, Miq., in leaves, but has larger flowers.

3. *CHISOCHETON KUNSTLERI*, King, n. sp. A shrub 6 to 20 feet



high. *Leaves* 12 to 18 in. long, their petioles and rachises rusty-tomentose; leaflets 3 to 5 pairs, oblong-oblong-lanceolate or lanceolate, cuspidate, slightly narrowed to the cuneate base. Upper surface glabrous except the tomentose midrib; under surface rusty-tomentose, the 16 to 18 pairs of spreading curving main nerves prominent. *Spikes* supra-axillary, solitary, on very long peduncles, rusty-tomentose; peduncles 6 to 12 in., the flowering part about 2 in. *Flowers* .5 to .6 in. long, crowded, subsessile, minutely bracteolate. *Calyx* cylindric, about .1 in. long, densely tomentose, the mouth with 4 minute teeth. *Petals* 4, oblong, concave at the apex, yellowish, sericeous outside, glabrous inside. *Staminal tube* shorter than the petals and coherent with them below, glabrous, with a few scattered coarse hairs near the middle outside, the mouth with 4 broad emarginate or erose teeth; anthers 4, elliptic, included. *Ovary* ovoid, sericeous; style cylindric with a few scattered hairs, stigma cylindric with a thin annulus at its base. *Fruit* sub-globular, tomentose, with a long thick apical beak, .75 in. in diam., the beak .5 in. long.

Perak : King's Collector, Nos. 4502, 7783, Scortechini.

4. *CHISOCHETON PENDULIFLORUS*, Planch. ex Hook. fil. Fl. Br. Ind. I, 550. A shrub or small tree; young branches tawny-tomentose. *Leaves* 15 to 24 in. long, their rachises tawny-tomentose: leaflets 5 pairs, opposite, with occasionally a terminal odd one, elliptic to ovate, the upper occasionally sub-obovate, all shortly acuminate; rounded at the base, or narrowed from above the middle to the sub-acute minutely cordate sub-oblique base; main nerves 15 to 18 pairs, spreading, rather prominent beneath; upper surface glabrescent, the midrib and nerves pubescent; the lower reticulate, sparsely pubescent, the midrib tomentose: length 3 to 9 in., breadth 1.5 to 3 in., petiolules less than .1 in., tomentose. *Panicles* about as long as the leaves, supra-axillary, on long drooping tomentose slender peduncles; the lateral branches few, short, densely flowered. *Flowers* .75 to nearly 1 in. long, on very short pedicels, dull red, 4- or 5- merous, clavate in bud, the lower part very slender especially in the barren flowers. *Calyx* short, tubular, the mouth entire or 4- or 5- toothed, coarsely pubescent. *Petals* 5, linear-spathulate, concave and thickened towards the apex, longer than, and in their lower part coherent with, the staminal tube, pubescent in the middle and glabrous on the edges outside. *Staminal tube* narrow, with a few coarse adpressed hairs near the apex outside, the mouth rather deeply 3- to 6- toothed, the teeth emarginate or erose. *Anthers* 3 to 5, narrow, elongate, sessile, included or slightly exserted. *Ovary* sub-ovoid, short, sub-glabrous. *Style* long, slender, adpressed-pubescent below, glabrous above. *Stigma* discoid, thick, surrounded at the base

by an annular band. *Fruit* (unripe) ovate, tomentose, on a very short thick stalk, .75 in. diam.; the apex with a curved thick blunt beak. C. De Cand. Mon. Phan. I, 536. *Melia penduliflora*, Wall. Cat. No. 1255.

Penang; Porter, Curtis. Malacca: Maingay (Kew Distrib.) No. 325. Perak; Scortechini, Wray, King's Collector.

In this species the flowers are of two kinds. One set, which are longer than the other, are very conspicuously clavate, the lower part being filiform; in these the ovary is small and infertile and the stamens are included. The other set have shorter thicker less clavate flowers, fertile ovaries, and exserted stamens.

5. *CHISOCHETON RUBIGINOSUS*, King n. sp. A tree 20 to 30 feet high. *Leaves* 2 to 3 feet long, the petiole and rachises tawny-tomentose, sub-compressed. *Leaflets* 4 to 8 pairs, coriaceous, sub-opposite, elliptic to oblong, very shortly acuminate, slightly narrowed to the rounded minutely sub-cordate base: upper surface glabrous, except the tomentose midrib and main nerves, sub-reticulate; the lower reticulate, rusty-pubescent; main nerves 12 to 18 pairs, spreading, rather straight, prominent beneath; length 5 to 12 in., breadth 2.5 to 4 in., petiolules about .1 in. *Panicles* spike-like, supra-axillary, about half as long as the leaves, on long peduncles, the branches very short and crowded near the apex, bracteolate. *Flowers* rather crowded, 1.25 to 1.5 in. long, on very short pubescent pedicels. *Calyx* cylindric, cup-like; the mouth truncate, entire or with 8 or 10 shallow irregular teeth; tomentose outside, glabrous inside. *Petals* usually 7 sometimes 8 or 9, linear, sub-spathulate, slightly concave and thickened at the apex, 1 to 1.25 in. long, tomentose externally, glabrous internally. *Staminal tube* shorter than the petals and free from them, narrowly cylindric and glabrous below, slightly expanded and pubescent at the mouth; mouth with 10 to 15 linear erect teeth: anthers from 10 to 15, elongate, alternating with the teeth and of about the same length. *Ovary* ovoid, sericeous like the cylindric style; stigma cylindric. *Fruit* (unripe) ovoid, rugose, densely rusty-tomentose, 1.5 in. long.

Perak: Scortechini, Wray, King's Collector.

This species is allied to *C. princeps*, Hemsl., but has a different inflorescence and smaller leaves. I think it possible that this may be *Melia tomentosa* Roxb., a species from Penang, of which there is no specimen extant, but of which there is a drawing (reduced in size) in the Calcutta Herbarium. The only serious discrepancy is that Roxburgh describes and figures only five petals; whereas in all the Perak specimens which I have examined there are at least 7, and in many 8, or 9, and in one even 10 petals.

6. *CHISOCHETON PRINCEPS*, Hemsley in Hook. Ic. Plant. t. 1844.



An unbranched tree 40 feet high. *Leaves* 9 to 10 feet long; the rachises somewhat compressed, puberulous. *Leaflets* coriaceous, opposite, oblong, acute, the base rounded and slightly oblique: upper surface rugulose, shining, glabrous except the tomentose midrib and main nerves; lower surface reticulate-areolate tawny-pubescent; main nerves 15 to 30 pairs, spreading and little curved; length 9 to 18 in., breadth 2·5 to 4·5 in.; petiolule ·3 in., stout. *Panicles* spike-like, 3 feet or more in length; the branches distant, sub-sessile, glomeriform, each crowded with 20 to 30 elongate obovate shortly pedicellate flowers 1·25 to 1·5 in. long. *Calyx* ·2 in. long, about one-seventh of the length of the petals, cupular, entire or with 3 or 4 rudimentary teeth, truncate, puberulous. *Petals* 5, linear-spathulate, concave at the apex, adpressed-sericeous outside, glabrous inside. *Staminal-tube* slightly adherent to and shorter than the petals, cylindric, slightly wider at the minutely 10-toothed mouth; villous in the lower half inside, otherwise glabrous; anthers 10, short, linear, sub-included. *Ovary* small, cylindric, 5-grooved, surrounded by a small annular disc. *Style* cylindric, sparsely pubescent, slightly longer than the staminal-tube, cylindric. *Fruit* sub-globular, the apex depressed, the sides vertically grooved, rusty-tomentose, 2·5 in. in diam. *Seeds* 3 to 5, 1·75 in. long.

Penang: Curtis No. 1519.

A remarkable species with very long pendulous leaves.

7. *CHISOCHETON GLOMERATUS*, Hiern in Hook. fil. Fl. Bl. Ind. I, 551. A tree 40 to 70 feet high; young shoots deciduously tomentose, the bark dark when dry. *Leaves* 12 to 18 in., the petiole and rachises pubescent; leaflets 2 or 3, rarely 4 pairs, thinly coriaceous, opposite, elliptic to elliptic-oblong, very shortly acuminate, the base rounded, unequal-sided; main nerves 9 to 11 pairs, spreading, prominent beneath; upper surface minutely punctate when dry, glabrous except the pubescent nerves and tomentose midrib; lower surface softly pubescent, the midrib and nerves tomentose; length 4 to 6·5 in., breadth 1·8 to 2·5, petiolule ·1 to ·15 in. *Panicles* solitary, drooping, supra-axillary, as long as the leaves; the lateral branches rather numerous, horizontal, pedunculate, each bearing several dense many-flowered small cymes, everywhere tomentose. *Flowers* ·25 in. long, sub-sessile, minutely bracteolate. *Calyx* short, tubular, puberulous outside, sub-entire or irregularly toothed, much shorter than the corolla. *Petals* 4, erect, elliptic, slightly concave, glabrescent. *Staminal-tube* much shorter than the petals and coherent with them, rather wide, glabrescent, the mouth with 6 to 8 long linear teeth. *Anthers* linear, elongate, much exserted. *Ovary* ovoid, tapering into the cylindric style, and like it tomentose. *Stigma* cylindric, rather long, glabrous. *Fruit* (immature) sub-globular, on thick slightly curved pedicels,

not apiculate, but tapering at the base into a short pseudo-stalk, rusty-tomentose, 1 in. in diam., seeds two. C. De Cand. in Mon. Phan. I, 532. *Schizochiton*? Wall. Cat 9040.

Penang, Porter. Perak: King's Collector, Nos. 8462, 10227, 10624.

I am not satisfied that two closely allied species are not united under the above, as there is some difference in the number of main nerves in the leaflets, those in the specimens of King's Collector, No. 8462, being rather less numerous than in the other gatherings.

8. *CHISOCHETON ERYTHROCARPUS*, Hiern in Hook. fil. Fl. Br. Ind. I, 550. A tree; young branches rather stout, densely and minutely rusty-tomentose. *Leaves* equally pinnate, 12 to 15 in. long; leaflets 4 to 6 pairs, opposite, coriaceous, elliptic-oblong to broadly ovate, shortly abruptly and bluntly acuminate, cuneate or rounded at the slightly oblique base; upper surface glabrous except the puberulous midrib; lower softly and shortly rusty-pubescent; main nerves 6 or 7 pairs, ascending, curving; length 2·5 to 5·5 in., breadth 1·35 to 2 in., petiolules 2 in. *Panicles* clustered towards the ends of the branches, extra-axillary, about half as long as the leaves, minutely rusty-tomentose; their lateral branches short, horizontal, cymose. *Flowers* ·45 in. long, their pedicels shorter. *Calyx* cylindric, the mouth truncate, sometimes minutely toothed, densely tomentose. *Petals* 6, longer than the calyx, fleshy, narrowly elliptic, blunt, adpressed-sericeous outside, glabrous inside. *Staminal-tube* shorter than the petals and pistil, outside sericeous below and glabrous above, inside villous, with 5 or 6 rather deep blunt emarginate teeth; anthers 5 or 6, included, elongate. *Ovary* narrow, pubescent; *style* tapering; *stigma* cylindric, with glabrous central mammilla. *Fruit* sub-globose, nearly 2 in. in diam., minutely tomentose, blood-red (fide Maingay) when ripe. *Seeds* ex-arillate, flattened, 1 in. long, the testa thick, orange-red. C. De Cand. in Mon. Phan. I, 534.

Malacca: Maingay (Kew Distrib.) No. 322.

9. *CHISOCHETON ANNULATUS*, King n. sp. A tree; *leaves* 18 to 30 in. long, the petioles and rachises 4-angled, pubescent; leaflets 4 to 7 pairs, membraneous, oblong or elliptic-oblong, shortly and abruptly acuminate, the base cuneate, both surfaces with very minute pubescence; main nerves 12 to 14 pairs, oblique, rather prominent beneath; length about 9 in., breadth 3 to 3·5 in., petiolules ·25 in. *Panicles* solitary, supra-axillary, puberulous, about as long as the leaves, with scanty spike-like few-flowered branches which become shorter upwards. *Flower-buds* clavate, ·5 to ·6 in. long, contracted into a pseudo-stalk at the base, their true pedicels ·25 in. long. *Calyx* campanulate, rusty-tomentose outside, completely enveloping the petals in bud, with a thickened wavy band



about its middle, and 4 broad convenient triangular teeth. *Petals* 6 or more, the outer three sericeous outside and glabrous inside, the inner quite glabrous; all broadly elliptic, free from the staminal-tube. *Staminal-tube* shorter than the petals, cylindric, glabrescent, the mouth with shallow broad erose teeth. *Stamens* 12, attached at the very base of the tube; anthers linear-elongate. *Ovary* conic, apparently 5-celled; *style* cylindric, pubescent; *stigma* discoid, concave.

Perak; Scortechini No. 7000, Curtis No. 2693.

In its leaves, and also to some extent in its inflorescence, this agrees with the type specimen of *C. spectabile*, Miq., collected by Korthals in Borneo, and now in the Herbarium at Leiden. That specimen is in bud only, and neither Scortechini's nor Curtis's specimens have fully expanded flowers. The buds both of this and of *C. spectabile* are of the same clavate shape. Miquel does not describe the flowers of *C. spectabile*, and the buds in Korthal's type specimen are so young and so few, that I did not dare to dissect one of them. The buds on Scortechini's scanty specimens of this are also too young for accurate examination. But an examination of one of Mr. Curtis's discloses the structure above described. The flowers are remarkable because of the waved thickened band which runs round the exterior of the calyx just below the teeth. The ovary, moreover, of this appears to have 5 cells, whereas the species of the genus *Chisocheton* have only 2 or 4. This character together with the lengthening of the base of the flower into a pseudo-stalk and the annular thickening of the base of the calyx, approximate this species to the genus *Megaphyllea*. In the meantime I put it into *Chisocheton*. Good flowering specimens of this singular plant are much to be desired.

10. *CHISOCHETON MACROPHYLLUS*, King, n. sp. A tree 60 feet high. *Leaves* 5 or 6 feet long, the petiole and rachis obliquely 4-angled, subglabrous; leaflets membranous, opposite, oblong, the apex with a short blunt acumen; the base broad, rounded, unequal-sided: upper surface quite glabrous, the lower paler, minutely pubescent on the midrib and nerves when young; main nerves 18 to 20 pairs, spreading, rather prominent beneath when dry; length 5 to 13 in., breadth 3·5 to 4 in., petioles ·3 in. *Panicles* 2 to 3 feet long, narrow, puberulous; the branches rather distant, from 1 to 3·5 in. long, the ultimate branchlets cymulose, many-flowered. *Flowers* ·5 or ·6 in. long, narrow, on pubescent pedicels less than ·1 in. long. *Calyx* cupular, pubescent, about ·05 deep, its mouth obscurely 4-toothed or entire. *Petals* 4, many times longer than the calyx, linear with spathulate concave apices, puberulous on the outer, glabrous on the inner surface. *Staminal-tube* slightly shorter than the petals, adherent to them for half its length, outside glabres-

cent below but hairy near the mouth; inside villous; mouth wider than the tube with 8 rather deep linear 2- to 3- toothed lobes; *anthers* oblong, slightly exserted. *Ovary* broadly ovoid, sericeous like the slightly compressed style; *stigma* small, cylindric, with the upper surface lobed. *Fruit* sub-globular, narrowed at the base, 3 in. in diam., the pericarp leathery thick and fleshy; pedicel very stout, swollen, 1 in. long.

Penang: Curtis No. 2469. Perak: Curtis No. 2327. Singapore: Ridley No. 4767.

11. *CHISOCHETON MACROTHYRSUS*, King, n. sp. A tree 20 to 40 feet high. *Leaves* about 2 feet long, the petiole terete, the rachis 4-angled, glabrous; *leaflets* 2 to 4 pairs, thinly coriaceous, elliptic-oblong, minutely acuminate, the base cuneate, both surfaces glabrous; main nerves 10 to 14 pairs, prominent beneath; length 3·5 to 9 in., breadth 1·5 to 3·5 in., petiolules ·25 to ·5 in. *Panicles* longer than the leaves, angled, glabrous; the branches distant, the lower again branched, the ultimate branchlets everywhere cymose. *Flowers* ·5 in. long, on very short pubescent pedicels. *Calyx* tubular, about ·1 in. long, truncate or waved, pubescent. *Petals* 5, five times as long as the calyx, elliptic, thickened and concave at the apex, minutely tomentose outside, glabrous inside. *Staminal tube* shorter than and free from the petals, its apex truncate, with about 14 broad shallow teeth, sericeous on both surfaces except towards the apex; *anthers* 7 or 8, rather small, included, attached some way below the mouth. *Ovary* ovoid-conic, sericeous like the tapering style; *stigma* cylindric, glabrous, with a flat ring at its base. *Fruit* depressed-globular, sub-rugose and with several vertical ridges, minutely tomentose, 1·5 in. in diam.

Perak: Scortechini, Wray, King's Collector.

I have seen only a single specimen in which the fruit approaches maturity. The majority of the fruiting specimens are in a young stage, and the young fruits are deeply rugose and furrowed and have a small apical beak. None of the specimens I have seen have their leaves intact, and it is possible they may have more leaflets than I have described above.

12. *CHISOCHETON LAXIFLORUS*, King, n. sp. A tree 20 to 40 feet high. *Leaves* 1 to 2 feet long, glabrous; *leaflets* 4 or 5 pairs, opposite, thinly coriaceous, elliptic to elliptic-oblong, cuspidate, slightly narrowed at the base, both surfaces minutely reticulate; main nerves 10 to 15 pairs, curved, ascending, depressed above and prominent beneath when dry; length 5 to 9 in., breadth 1·75 to 3 in., petiolules ·2 in. *Panicles* solitary, extra-axillary, slender, with a few primary branches; the secondary branches short, few-flowered, the flowers usually in distant pairs, sessile, ·4 or ·5 in. long. *Calyx* puberulous outside, less than ·1 in. long,



shortly cylindric, mouth entire or sometimes obscurely crenate, truncate. *Petals* 4, many times longer than the calyx, linear, obtuse, slightly concave at the apex, puberulous outside, glabrous inside. *Staminal tube* nearly as long as the petals and free from them, villous outside, glabrous inside, the mouth slightly waved. *Anthers* 5, elliptic, included. *Ovary* small (in the male flowers), sericeous. *Style* longer than the staminal tube, sericeous at the base, otherwise glabrous, stigma cylindric. *Ovary* of female flower not seen. *Fruit* depressed-globose, tapering into a short pseudo-stalk, minutely tomentose, 1·5 in. in diam., crimson when ripe.

Perak: Scortechini, Nos. 219 and 388; King's Collector, Nos. 1876, 4348, 5735, 5765, 7783.

In many respects this resembles *C. patens*, Bl., but it has larger flowers and much less pyriform fruit. The staminal tube of this is moreover only slightly toothed at the apex, whereas that of *C. patens* has 6 long lanceolate teeth.

13. *CHISOCHETON PATENS*, Blume, Bijdr. 169. A tree 20 to 40 feet high. *Leaves* with the petiole and rachis almost glabrous, 1 to 3 feet long; leaflets 10 to 13 pairs, opposite or sub-opposite, thinly coriaceous, oblong-lanceolate, rarely oblong-elliptic, shortly acuminate, the base narrowed and unequal-sided; both surfaces glabrous, reticulate, the lower pale and with the 10 to 14 pairs of curved spreading nerves and also the reticulations prominent; length 4 to 7 in., breadth 1 to 2·5 in., petiole .15 to .4 in. *Male panicles* about as long as the leaves (the female shorter), supra-axillary, pendulous, glabrous, with numerous divergent branches the lower of which are compound, the middle spike-like, and the uppermost short and cymose. *Flowers* .35 in. long, on short rather stout pedicels. *Calyx* cupular, puberulous outside; the mouth entire, truncate or wavy. *Petals* 4, three or four times as long as the calyx, sub-spathulate elliptic, glabrous, longer than and quite free from the staminal-tube. *Staminal tube* free from the petals, cylindric, expanding slightly upwards, pubescent near the mouth, otherwise glabrous outside, pubescent inside, the mouth with 6 long lanceolate teeth which are slightly shorter than the 6 linear elongate anthers. *Ovary* very small, surrounded by a notched fleshy glabrous disc; *style* cylindric, pubescent; *stigma* cylindric, glabrous. *Fruit* pyriform, attenuated below into a thick pseudo-stalk, glabrous; length 2·25 in. of which the stalk-like part is 1 in. Miq. Fl. Ind. Bat. Vol. I, Pt. 2, 537; Ann. Mus. Lugd. Bat. IV, 29; C. De Cand. Mon. Phan. I, 528. *C. holocalyx*, Hiern in Hook. fil. Fl. Br. Ind. I, 551. C. De Cand. l. c. 529.

Malacca: Maingay (Kew Distrib.) No. 328. Singapore; Anderson No. 30, Hullett No. 800, Ridley No. 4763. Perak: Scortechini No. 324;

King's Collector Nos. 3312, 10750; Wray No. 1279. Penang: Curtis No. 1685. Pahang Ridley No. 4765.

This species, although a much smaller tree, very much resembles *C. divergens*, Bl. in its leaves and inflorescence. The leaflets, however, are of a thicker texture than those of *C. divergens* and they dry of a different colour. The flowers of the two are almost exactly alike in structure; but those of *C. divergens* are yellow and very fragrant, while those of *C. patens* are greenish-white and have a disagreeable odour like that of *Paederia foetida* and of some species of *Lasianthus*. The fruits of the two moreover differ, those of *C. divergens* being turbinate-globular or nearly so, of a yellow colour, and more or less tomentose; while the fruits of *C. patens* are of a deep red colour and glabrous when quite ripe. I have compared the type specimens of *C. patens*, Bl. and of *C. holocalyx*, Hiern., deposited, respectively, at Leiden and Kew, and I find the two to be identical.

14. CHISOCHETON DIVERGENS, Blume, Bijdr. 169. A tree 40 to 100 feet high; young branches glabrous, the bark dark-coloured. Leaves 9 to 18 in. long, the main rachis deciduously puberulous; leaflets 4 to 12 pairs, membranous, opposite or sub-opposite, narrowly oblong or oblong-lanceolate, shortly acuminate, slightly narrowed to the rounded or slightly cuneate unequal base; both surfaces glabrous, reticulate, the 10 to 12 pairs of curving ascending nerves prominent on the lower when dry; length 2.5 to 6 in., breadth 1.15 to 1.75 in., petiolules .15 to .25 in. Panicles solitary, supra-axillary, pendulous, about as long as the leaves, pyramidal, the lower branches of the male panicles 6 or 7 in. long, of the female 4 or 5 in., the ultimate branchlets of both cyme-like, dense, many-flowered. Male Flowers .25 in. long, on short pubescent pedicels. Calyx cupular, puberulous, the mouth entire or waved. Petals 4, three or four times as long as the calyx and slightly longer than the staminal-tube, recurved, elliptic, obtuse, sub-glabrous. Staminal-tube free from the petals, widely tubular, glabrous except a few strong hairs at the throat, the mouth with 6 lanceolate spreading teeth; anthers 6, linear-elongate, about as long as the teeth of the calyx. Ovary small, surrounded by a narrow fleshy glabrous disc; style cylindric, pubescent; stigma small, disc-like with an annulus at its base. Female flowers like the males, but usually without anthers; the ovary ovoid-conic, pubescent. Fruit obovoid or depressed-globose, tapering at the base into a pseudo-stalk, minutely tomentose, 1.5 in. in diam., 2-celled, seeds about 2. Miq. Fl. Ind. Bat. I, Pt. 2, 537; Ann. Mus. Lugd. Bat. IV. 28; C. De Cand. Mon. Phan. I, 529. *C. fragrans*, Hiern in Hook. fil. Fl. Br. Ind. I, 551; C. De Cand. l. c. 529.

Malacca: Griffith, No. 1062/1 Maingay, (Kew Distrib.) No. 324.



Perak; King's Collector, Nos. 4631, 4795, 6864? Burma: Wall. Cat. 8069.

I have compared the authentic specimens of the Leiden Herbarium of *C. patens*, Blume, with the type specimens at Kew of *C. fragrans*, Hiern; and I find them to agree exactly. I therefore adopt the older name. The male panicles of this are rather longer and wider at the base than the female panicles; but both are pyramidal. I believe the plant issued by Wallich as a *Cupania* (No. 8069 of his Catalogue) may belong to this. The specimens are in fruit only and were originally named by Wallich *Trichelia longissima*.

### 5. DYSOXYLUM, Blume.

Trees, mostly glabrous. *Leaves* pinnate; leaflets entire, opposite sub-opposite or alternate, more or less acuminate at the apex and oblique at the base, coriaceous. *Flowers* paniculate, racemose or spicate, hermaphrodite. *Calyx* 4- rarely 5-fid, dentate or partite or sub-entire, imbricated, not accrescent. *Petals* 4, rarely 5, oblong, spreading, valvate or slightly imbricated. *Staminal tube* cylindrical, dentate or crenulate at the mouth; *anthers* 6, 8 or 10, short, included or the tips exserted. *Disc* tubular, equal to or twice as long as the ovary, crenulate or entire at the mouth. *Ovary* usually 3- 4-celled; style about equalling the staminal tube; ovules usually 2 in each cell. *Capsule* globose or pear-shaped, coriaceous (often thickly so), 1- 4-celled, loculicidal; seeds arillate or exarillate, exalbuminous.—

DISTRIB. Species about 100, mostly found in the Malay Archipelago, but some in Australasia.

FLOWERS PENTAMEROUS. ... 1. *D. arborescens*.

FLOWERS TETRAMEROUS.

*Inflorescence paniculate.*

Panicles slender, lax, few-flowered.

Leaflets linear-lanceolate; flowers .6 in.

long ... 2. *D. angustifolium*.

Leaflets oblong-lanceolate, caudate-acu-

minate; flowers .15 in. long ... 3. *D. dumosum*.

Panicles with few branches; the branchlets

very short, spicate, distant; the flowers  
only .1 in. long, densely crowded ... 4. *D. interruptum*.

Panicles with many divaricating branches,  
many-flowered.

Leaflets minutely rugulose when dry,  
their main nerves indistinct ... 5. *D. acutangulum*.

Leaflets not rugulose when dry, their  
main nerves distinct

Veins of leaflets winged ; flowers

·25 in. long ... 6. *D. venulosum*.

Veins of leaflets not winged.

Disc hairy, slightly exceeding

the sub-strigose ovary ;

flowers ·15 in. long ... 7. *D. thyrsoides*.

Disc glabrous, half as long as

the style, slightly constrict-

ed below the thickened pi-

lose mouth, ovary densely

pubescent ; flowers ·45 in. long 8. *D. turbinatum*.

Disc glabrous, slightly longer

than the glabrous

ovary ; flowers ·2 in. long 9. *D. costulatum*.

Disc glabrous outside, pubes-

cent inside, much longer

than the densely adpressed-

pubescent ovary ; flowers ·5

in. long ... 10. *D. macrothyrsum*.

*Inflorescence spicate or racemose.*

Spikes or racemes from the stem or from  
the branches below the leaves.

Disc membranous, glabrous, obscure-

ly crenate, longer than the densely

pubescent narrowly ovoid ovary ;

flowers ·3 to ·35 in. long ; fruit

obovoid, apiculate, glabrous ... 11. *D. cauliflorum*.

Disc fleshy, longer than the tomen-

tose-lepidote sub-globular ovary ;

flowers ·25 in. long ; fruit ovoid,

rusty-tomentose ... 12. *D. Griffithii*.

Disc thinly fleshy, glabrous, crenu-

late, longer than the depressed

sericeous ovary ; flowers ·15 in.

long ; fruit obovoid, apiculate, ob-

scurely 4-angled, tawny-tomentose 13. *D. densiflorum*.

Disc membranous, glabrous outside,

pubescent inside, as long as the

obovoid-conic sparsely pubescent ovary ;

flowers ·35 in. long ; fruit sub-

globose ... 14. *D. cuneatum*.



Spikes or racemes axillary.

Spicate cymes or racemes from 4 to 8 in. long.

Disc fleshy, glabrous, crenulate, slightly longer than the hemispheric densely puberulous ovary; flowers .2 in. long ... 15. *D. racemosum*.

Disc puberulous, with thickened rugulose pilose mouth; longer than the ovoid-conic pubescent ovary; flowers .6 in. long ... 16. *D. microbotrys*.

Spikes from 2 to 4 in. long.

Disc glabrous, longer than the puberulous 4-furrowed ovary; flowers .35 in. long ... 17. *D. flavescens*.

Spikes or racemes not more than 2 in. long.

Leaves not rugulose when dry.

Disc fleshy, annular, crenulate, shorter than the conic pubescent ovary; flowers .5 in. long ... 18. *D. andamanicum*.

Leaves rugulose or papillose.

Disc fleshy, glabrous, 8- to 9- toothed, exceeding the hemispheric ridged puberulous ovary; flowers .2 in. long ... 19. *D. rugulosum*.

Flower buds globose, .15 in. in diam.; calyx campanulate; disc none, or very small, ovary broadly ovoid ... 20. *D. papillosum*.

1 *DYSOXYLUM ARBORESCENS*, Miq. in Ann. Mus. Lugd. Bat. IV, 24. A tree 20 to 30 feet high. *Leaves* 6 to 9 in. long, unequally pinnate, glabrous; leaflets 2 to 3 pairs, membranous, opposite or sub-opposite, elliptic (sometimes rather broadly so), slightly obovate, shortly abruptly and obtusely acuminate, the base very cuneate; main nerves 6 to 8 pairs spreading, curving, not prominent on either surface; length 2.5 to .5 in., breadth 1.25 to 2.25 in., the odd leaflet usually the largest; petiolules slender, .3 to .5 in., that of the odd leaflet often 1 in. *Panicles* extra-axillary, solitary, 1.5 to 4 in. long, with a few short lax-flowered divaricating branches. *Flowers* .25 in. long, on thin pedicels of the same length. *Calyx* a very shallow obscurely toothed cup. *Petals* 5, linear, slightly thickened and narrowed towards the apex, glabrous, longer than the sta-

minal tube. *Staminal tube* widely cylindric, inflated or not at the base, shorter than the style, glabrous, with 10 broad shallow sub-crenate teeth; *anthers* small, ovate, included, or the tips exerted. *Disc* widely tubular, thick, fleshy, sub-crenulate, longer than the ovary. *Ovary* depressed, ovoid-globular, pubescent, 4-celled; *style* cylindric, sparsely pubescent below, glabrous above; *stigma* discoid with a broad projecting annulus at its base. *Fruit* turbinate, with 3 or 4 (sometimes only 2) vertical grooves, glabrous, not narrowed into the stalk, 1·25 in. in diam., 2- to 4-seeded. *Seeds* ovoid, apparently ex-arillate. C. De Cand. Mon. Phan. I, 489, (excl. syn. *D. lampongum*, Miq.). *D. Maingayi*, Hiern in Hook. fl. Fl. Br. Ind. I, 547; C. De Cand. l. c. 490. *Goniocheton arborescens*, Blume Bijdr. 177: Miq. Fl. Ind. Bat. I, pt. 2, p. 540. *Hartigsea acuminata*, Miq. Fl. Ind. Bat. Suppl. 196, 504. *Trichelia arborescens*, Spreng. Syst. Vol. IV, cur. post. p. 252.

Malacca: Maingay (Kew Distrib.) No. 359. Perak: Scortechini, Wray. S. Andaman; King's Collectors. DISTRIB. the Malayan Archipelago.

The flowers of some of the Andamans specimens are 6-merous.

2. *DYSOXYLUM ANGUSTIFOLIUM*, King n. sp. A glabrous tree; young branches slender, terete. *Leaves* 10 to 12 in. long, equally pinnate; leaflets about 5 pairs, opposite, membranous, linear-lanceolate, the base much narrowed; main nerves 9 to 12 pairs, oblique, little curved, obsolete on the upper, faint on the lower, surface; length 3·5 to 5·5 in., breadth 5 to 6·5 in., petiolules ·25 in. *Panicles* extra-axillary, slender, lax, 1·5 to 4·5 in. long. *Flowers* ·6 in. long, each at the apex of a short minutely bracteolate branchlet. *Calyx* shortly cupular, with 4 triangular teeth, glabrous, fleshy, tapering below into a short fleshy pedicel. *Petals* 4, many times longer than the calyx, linear-oblong, sub-acute, slightly thickened and connivent at the apex, minutely puberulous outside, glabrous inside. *Staminal tube* nearly as long as the petals, cylindric, rather fleshy like the petals, glabrous, very slightly wider at the obscurely 8-toothed apex; *anthers* 8, elliptic-oblong, included. *Disc* tubular, much longer than the ovary, and one-third of the length of the style, fleshy, glabrous except at the thickened obscurely 8-toothed pubescent mouth. *Ovary* ovoid, 4-angled, puberulous, 4-celled, tapering into the long 4-angled puberulous style; *stigma* slightly exerted, rather small, discoid, with a broad basal annulus. *Fruit* (unripe) obovoid, tapering much at the base, glabrous, about 1 in. long, peduncle 1 in.

Pahang; Ridley, Nos. 2656 and 5840.

The flowers of this have a strongly alliaceous odour.

3. *DYSOXYLUM DUMOSUM*, King, n. sp. A shrub 3 to 6 feet high.



*Leaves* 5 to 14 in. long, equally pinnate, the petioles angled and channelled in front; *leaflets* opposite, 2 or 3 rarely 5 pairs, membranous, oblong-lanceolate, shortly and bluntly caudate-acuminate, much narrowed to the base; main nerves 7 or 8 pairs, curved, quite obscure on both surfaces, length 2·5 to 4·5 in. rarely 5 in.; breadth ·75 to 1·45, rarely 1·75 in., petiolules 2 in. *Panicles* shorter than the leaves, extra-axillary, pedunculate, with a few spreading scantily-flowered branches in the upper part, or racemose and branched from the base, 1·5 to 4 in. long. *Flowers* ·15 in. long, on bracteolate pedicels as long as or longer than themselves. *Calyx* cupular, much shorter than the petals, glabrous, with 4 (rarely 5) small teeth. *Petals* 4, slightly unequal, broadly oblong with truncate bases, obtuse, the apex thickened and slightly incurved, glabrous or sub-glabrous. *Staminal tube* shorter than the petals and adherent to their bases, widely cylindric, glabrous, the mouth with 8 broad shallow emarginate teeth; anthers alternate with the teeth, shortly ovate, sub-exserted. *Disc* fleshy in the fertile female flowers, slightly longer than the ovary and lobed; in the fertile male flower shorter and entire. *Ovary* depressed, pilose; *style* cylindric, sparsely pilose below; *stigma* in the fertile female broadly discoid, 5-angled, with an annular disc beneath it, in the fertile male cylindric. *Fruit* depressed-globular, glabrous, ·5 in. in diam., crowned by the base of the style, 4-celled, with 3 or 4 shining black seeds.

Perak : Scortechini, King's Collector. Johore : Ridley, No. 4194.

In habit this resembles *D. arborescens*, from which, however, it is at once distinguished by its equally pinnate leaves and tetramerous flowers.

4. *DYSOXYLUM INTERRUPTUM*, n. sp. King. A tree 30 to 40 feet high; young branches cinereous-pubescent. *Leaves* 24 to 30 in. long, equally pinnate; leaflets about 10 pairs, membranous, sub-opposite or opposite, oblong to elliptic-oblong, shortly and sharply acuminate, the base cuneate; upper surface glabrous, the nerves and midrib pubescent; lower surface puberulous, the 18 to 24 pairs of straight sub-ascending main nerves rather prominent and with long sparse hairs; length 5 to 7 in., breadth 2·25 to 2·75 in., petiolules ·1 to ·2 in. *Panicles* solitary, slightly supra-axillary, with few spreading branches; the ultimate branchlets very short, distant; the flowers ovoid, densely crowded, sessile, ·1 in. long. *Calyx* cupular, pubescent, with 4 or 5 triangular acute spreading teeth. *Petals* 4, longer than the calyx, erect, valvate, elliptic, sub-acute, the sides straight, pubescent outside, puberulous inside. *Staminal tube* shorter than the petals, cylindric, glabrous, the mouth with 8 rather broad bifid teeth. *Anthers* 8, short, elliptic, included. *Disc* shortly cylindric, longer than the ovary, fleshy, glabrous; its

mouth with 8 obscure broad blunt teeth. *Ovary* depressed and broadly ovoid, pilose, 3-celled; style short, stout: *stigma* thickly discoid with an annulus at its base. *Fruit* unknown.

Perak: King's Collector, No. 6349.

A very distinct species distinguished at once by its small densely crowded flowers in interrupted spicate panicles.

5. *DYSOXYLUM ACUTANGULUM*, Miq. Fl. Ind. Bat. Suppl. 196, 503; Ann. Mus. Lugd. Bat. IV., 26. A glabrous tree, the young branches rather stout with pale brown striate bark. *Leaves* 6 to 12 in. long, equally pinnate: the rachis and petiole 4-angled: leaflets 3 or 4 pairs, coriaceous, opposite or sub-opposite, unequal-sided especially towards the more or less acute base, elliptic or ovate, or sometimes slightly obovate, the apex acute or shortly acuminate, both surfaces minutely rugulose and of a pale olivaceous colour when dry; main nerves imperceptible; length 2·5 to 4·5 in., breadth 1·25 to 2·2 in., petiolule ·2 to ·25 in. *Panicles* 2·5 to ·4 in. long, spreading, puberulous, *Flowers* rather crowded, ·35 in. long. *Calyx* puberulous, very shallow, with 4 deep reflexed triangular teeth. *Petals* 4, thin, much larger than the calyx, oblong, sub-acute, puberulous on both surfaces. *Staminal tube* a little shorter than the petals, cylindric, the mouth with 8 rather deep sharp teeth, striate, puberulous on both surfaces; *anthers* 8, oblong, rather small, slightly exerted. *Disc* widely tubular, slightly exceeding the ovary, fleshy, its mouth slightly inflexed, obscurely 8-toothed. *Ovary* adpressed-pubescent, broadly ovoid, tapering into the long style: style glabrescent in its upper part, adpressed-pubescent in the lower. *Stigma* exerted, shortly cylindric, with a small annulus at its base. *Fruit* obovoid, 3 in. long; the pericarp very coriaceous, glabrous, pale brown when dry and minutely rugulose, 3-celled. *Seeds* one in a cell, ellipsoid and apparently when fresh embedded in pulp. C. DC. in Mon. Phan. I., 525.

Singapore: Ridley, No. 3828. Perak: Scortechini, No. 1048. *DISTRIB.* Bangka.

The late Fr. Scortechini collected only a single specimen of this which is in flower, and Mr. Ridley collected it in fruit in Singapore. These specimens agree absolutely in their leaves with a specimen from Bangka now in the Leiden Herbarium on which Miquel founded the species.

Miquel does not describe the flowers, and the specimen lent to me by the Leiden Herbarium has none. In the Leiden Annals, Miquel expresses a doubt whether this plant may not be Aurantiaceous. The flowers (which Miquel had never seen) are however unmistakably Meliaceous, and the leaflets moreover are not pellucid-dotted.



6. *DYSOXYLUM VENULOSUM*, King, n. sp. A tree 50 to 80 feet high; young branches rather stout, angled, puberulous. *Leaves* 12 to 18 in. long, the petiole and rachis angled and puberulous, equally or unequally pinnate; leaflets 7 to 14, membranous, alternate, oblong, slightly unequal-sided, acuminate, the base much narrowed and oblique; both surfaces glabrous, the 13 to 15 pairs of oblique curving main nerves indistinct on the upper, rather prominent on the lower, the veins on both surfaces prominent and winged when dry; length 5 to 7 in., breadth 1.35 to 1.75 in., petiolules .25 in. *Panicles* extra-axillary, 6 to 8 in. long, glabrescent; the branches numerous, short, sub-horizontal, few-flowered. *Flowers* .25 in. long; their pedicels about the same length, jointed at the middle. *Calyx* cupular, with 4 shallow teeth, glabrous. *Petals* 4, much longer than the calyx, densely hairy, puberulous externally, sparsely so internally, oblong, obtuse, the apex slightly thickened and inflexed. *Staminal tube* slightly shorter than the petals, glabrous, cylindric, its mouth irregularly and minutely toothed; anthers 8, oblong, inserted below the mouth of the tube. *Disc* cylindric, fleshy, glabrous, about as long as the ovary, the mouth with 4 broad minutely erose teeth. *Ovary* ovoid, hoary-pubescent, tapering into the long cylindric sub-glabrous style; *stigma* slightly exserted, thickly discoid with an annulus at its base. *Fruit* unknown.

Perak: King's Collector, No. 1036.

7. *DYSOXYLUM THYRSOIDEUM*, Griff. ex Hook. fil. Fl. Br. Ind. I., 547. A tree; leaves 12 to 16 in. long, their petioles and rachises angled; leaflets about 8, alternate, coriaceous, elliptic-oblong to elliptic, shortly acuminate, slightly narrowed to the oblique base, both surfaces quite glabrous; main nerves 6 to 8 pairs, curved, ascending, slightly depressed in the upper and prominent on the lower surface when dry; length 4.5 to 8.5 in., breadth 1.75 to 3 in., petiolules .3 in. *Panicles* slightly extra-axillary, pyramidal, with stout rachises less than half the length of the leaves; their main branches divaricating, the ultimate racemose; flowers numerous, .15 in. long, their pedicels nearly as long. *Calyx* one-third of the length of the petals, cupular, coarsely and irregularly 4-toothed, glabrous. *Petals* 4, oblong, obtuse, glabrous. *Staminal tube* shorter than the petals and attached to them, cylindric, glabrous outside, pubescent inside, its mouth with 8 broad sub-crenate teeth; *anthers* short, ovate, included. *Disc* tubular, fleshy, hairy, slightly exceeding the ovary, truncate. *Ovary* narrowly ovoid, sub-strigose, 3-celled; *style* cylindric, thick, as long as the staminal tube; *stigma* exserted, discoid with a basal ring. *Fruit* (fide Hiern) "obovoid, fleshy, 2-3-lobed, umblicate, nearly 1 in. long; fruiting peduncles woody, stout, seeds ex-arillate." C. DC. in Mon. Phan. I., 481.

Malacca, Griffith, (Kew Distribution) No. 1053. Penang: Curtis, Nos. 2467, 2468. Andamans: King's Collectors.

Var. *Andamanica*: flowers .25 in. long, calyx very short: panicles sometimes as long as the leaves, lax.

S. Andamans. King's Collectors.

This differs from typical *D. thyrsoides* chiefly in the points above noted. When better specimens of the typical Malacca form are obtained, characters may be found sufficient to separate the two specifically.

8. *DYSOXYLUM TURBINATUM*, King n. sp. A small tree 12 to 20 feet high; young branches rather stout, the bark pale brown and striate. *Leaves* 10 to 16 in. long, the petioles and rachises glabrous, terete, equally pinnate; leaflets 2 to 4 pairs, sub-opposite, thinly coriaceous, elliptic to elliptic-oblong, shortly and bluntly acuminate, the base rounded or slightly narrowed, not oblique; both surfaces glabrous, the lower sub-glaucous, very minutely dotted, the nerves pubescent when young; main nerves 8 to 11 pairs, curved, spreading, very prominent on the lower, slightly depressed on the upper surface; length 3 to 6 or even 8 in., breadth 1.5 to 2.5 in. or even 3.5 in., petiolules .35 in. *Panicles* supra-axillary, 3 to 11 in. long, puberulous, rather slender, with few distant minutely bracteolate branches each bearing 5 to 10 flowers mostly in its upper half. *Flowers* .45 in. long. *Calyx* cupular, pubescent, narrowed to a short fleshy pedicel, its mouth with 4 short triangular teeth. *Petals* 4, linear-oblong, thickened and slightly concave at the apex, minutely adpressed-pubescent outside, with a few fleshy hairs inside at the apex, otherwise glabrescent. *Staminal tube* cylindric, slightly shorter than the petals, the mouth with 8 shallow broad truncate teeth, puberulous outside, glabrous inside. *Anthers* oblong, short, included. *Disc* half as long as the style, tubular, slightly constricted below the thickened pilose mouth, otherwise glabrous. *Ovary* narrowly ovoid, densely pilose; style 4-angled, glabrescent; stigma slightly exserted, small, discoid, with a basal annulus. *Fruit* depressed-globular, tapering at the base into a short pseudo-stalk, covered with brownish pale-edged scales, 1.5 in. length (excluding the pseudo-stalk) and slightly more in diameter.

Perak: King's Collector, No. 8751. Johore: Herb. Ridley, No. 4060. Malacca: Griffith.

In the above description the flowers are described from the specimens of Mr. Ridley and of my own collector, and the fruit from a single Griffithian specimen from Malacca which has no flowers, the three being in my opinion identical.

9. *DYSOXYLUM COSTULATUM*, Miq. in Ann. Mus. Lugd. Bat. Vol. IV.,



21. A glabrous tree 40 to 50 feet high. *Leaves* 9 to 14 in. long; *leaflets* sub-coriaceous, opposite, about 4 pairs, elliptic-oblong or elliptic, cuspidate or shortly acuminate; the base acute, slightly oblique; main nerves 10 to 12 pairs, curved, spreading, stout and prominent on the lower surface; length 3·5 to 6 in., breadth 1·5 to 2·75 in., petiolules about ·3 in. *Panicles* axillary or terminal, about half as long as the leaves or less; their branches divaricating and racemoid, glabrous. *Flowers* not crowded, about ·2 in. long, on short pedicels, bracteolate; pedicels cylindric in bud. *Calyx* a very short obscurely 4-toothed cup. *Petals* 4, oblong, obtuse, minutely puberulous externally. *Staminal tube* free from and nearly as long as the petals, cylindrical, the mouth with 8 broad shallow crenulate teeth, glabrous outside, villous inside. *Anthers* 8, short, ovate, included. *Disc* tubular, glabrous, crenately 4-toothed, longer than and surrounding the ovary. *Ovary* glabrous, narrowly ovoid, tapering into the cylindric style. *Stigma* slightly exerted, discoid with a band round its base. *Fruit* depressed-globular with 3 shallow vertical grooves; tapering at the base into a pseudo-stalk, 1·5 in. or more in diam., 4-celled; the pericarp woody, glabrous. Seeds sub-globular. C. De Cand. in Mon. Phan. I, 503. *D. brevipes*, Hiern in Hook. fil. Fl. Br. Ind. I, 560; C. DC. in Mon. Phan. I, 503. *Hartighsea costulata*, Miq. Fl. Ind. Bat. Suppl. 196, 505.

Malacca: Griffith; Maingay, Nos. 319, 320 (Kew Distrib.), Stolickza, Wray, King's Collector. Pahang: Ridley. Singapore: Ridley. Distrib. Sumatra.

The type specimens of *D. brevipes* Hiern at Kew agree exactly with those of the older *D. costulatum* Miq. in the Royal Herbarium at Leiden.

10. DYSOXYLUM MACROTHYRSUM, Miq. in Ann. Mus. Lugd. Bat. IV., 20. A tree 30 to 60 feet high; young branches rather stout, striate. *Leaves* 11 to 16 in. long, equally pinnate, the petioles and rachises puberulous: *leaflets* thinly coriaceous, 3 or 4 pairs, opposite, oblong-lanceolate to elliptic-oblong or elliptic, shortly acuminate, the base cuneate and slightly oblique; upper surface glabrous except the sometimes puberulous midrib, the lower glabrous: main nerves 8 to 11 pairs, spreading, prominent and almost winged on the lower faintly depressed on the upper surface; length 3 to 5·5 in. or even 7 in., breadth 1·5 to 2·25 in., petiolules ·25 to ·4 in. *Racemes* slightly supra-axillary, slender, puberulous, few-flowered, 4 to 7 in. long. *Flowers* ·5 in. long, distant, on short bracteolate pedicels. *Calyx* a short fleshy rugulose puberulous cup, with 4 broad triangular teeth. *Petals* 4, deflexed, many times longer than the calyx, narrowly oblong, slightly widened at the base; the apex sub-acute, slightly thickened and inflexed, externally with dense pale adpressed hairs, internally glabrescent. *Staminal tube*

shorter than the petals, cylindric, adpressed-pubescent outside, the mouth almost entire or minutely toothed. *Anthers* 8, linear-elliptic, their apices not reaching the mouth of the tube. *Disc* much longer than the ovary, cylindric, glabrous externally, softly pubescent internally especially at the acutely 8-toothed mouth. *Ovary* narrowly ovoid-conic, tapering into the long glabrous cylindric style, 4-angled, densely adpressed-pubescent; stigma exserted, thickly discoid, rugulose, with a narrow annulus at its base. *Fruit* turbinate, with four shallow vertical grooves and four broad rounded angles, sub-glabrous, crowned for a time by the persistent stout short style, when fully ripe white slightly tinged with pink, about 1.25 in. long, and 1.5 in., or more in diam. C. DC. in Mon. Phan. I, 485. *D. Lampongum*, Miq. Fl. Ind. Bat. Suppl. 196, 303 (excl. var. B., fide Miq. Ann. Mus. Lugd. Bat. IV., 20.)

Perak: King's Collector, Nos. 5428, 6788, 10440; Wray, Nos. 2329, 3072. Selangore: Ridley, No. 1892. Distrib. Borneo.

I follow Miquel and M. C. deCandolle in keeping this species up. It is, however, very closely allied to *D. excelsum*, Bl. The panicles of Perak specimens are rather shorter and fewer-flowered than in those collected in Borneo; in other respects they agree.

11. *DYSOXYLUM CAULIFLORUM*, Hiern in Hook. fil. Fl. Br. Ind. I., 549. A tree 30 to 50 feet high. *Leaves* 1 to 2 feet long, their petioles and rachises deciduously rusty-puberulous, angled, unequally pinnate; leaflets 9 to 13, membranous, opposite or alternate, oblong-elliptic or elliptic, shortly acuminate, the base cuneate or rounded at one side and obliquely cut away at the other; both surfaces glabrous except the pubescent midrib; main nerves 8 to 13 pairs, spreading, rather prominent on the lower surface; length 4 to 7 in. occasionally 12 in., breadth 1.75 to 2.75 in., petiolules .2 to .3 in. *Spikes* from 1 to 3 in. long, tawny-tomentose, in dense clusters on rugose woody tubercles from the stem. *Flowers* .3 to .35 in. long, their pedicels about .1 in., bracteolate at the base. *Calyx* cupular, with 3 or 4 broad irregular teeth, pubescent. *Petals* 4, oblong, obtuse, glabrous inside, glabrous or puberulous outside, free from the staminal tube. *Staminal tube* cylindric, glabrescent or sparsely sericeous outside, sericeous inside, the mouth with 8 broad shallow bifid teeth; *anthers* 8, ovate, included. *Disc* tubular, membranous, longer than the ovary, glabrous, the mouth obscurely crenate. *Ovary* narrowly ovoid, densely pilose; the style cylindric, sparsely pilose in the lower, glabrous in the upper half. *Stigma* slightly exserted, broadly discoid with a narrow annulus at its base. *Fruit* ovoid, apiculate, tapering slightly at the base, substriate, glabrous, red-coloured, splitting into 4 valves. *Seeds* sub-globular, plano-convex, .5 in. long. C. DC. in Mon. Phan. I., 498.



Malacca : Griffith, Maingay, No. 327 (Kew Distrib.). Singapore ; Anderson, Hullet. Perak : Scortechini, Wray, King's Collector.

12. *DYSOXYLUM GRIFFITHII*, Hiern in Hook. fil. Fl. Br. Ind. I., 549. A tree. *Leaves* 12 to 18 in. ; leaflets 9 to 13, membranous, alternate, oblong-lanceolate, acuminate, the base cuneate, glabrous, shining, (olivaceous when dry) ; main nerves numerous, spreading, indistinct on both surfaces, the midrib thin but slightly prominent on the lower ; length 3 to 5 in., breadth 1 to 1·5 in., petiolules ·1 in. *Racemes* from the axils of fallen leaves, ·5 to 1·5 in. long, stout, minutely bracteolate. *Flowers* ·25 in. long, their pedicels less than ·1 in. *Calyx* nearly flat, very short. *Petals* 4, oblong, obtuse, puberulous outside. *Staminal tube* slightly shorter than the petals, cylindric ; its mouth with 8 broad shallow sub-emarginate teeth, puberulous outside ; anthers 8, ovate, their tips exserted. *Disc* shortly cylindric, crenulate, fleshy, longer than the ovary. *Ovary* sub-globular, 4-angled, minutely tomentose-lepidote, 3- to 4-celled. *Style* as long as the staminal tube, 4-angled, puberulous : *stigma* discoid, with an annulus at its base. *Fruit* unknown. C. DC. in Mon. Phan. I., 497. *Hartighsea ramiflora*, Griff. Notulæ IV., 501.

Malacca, Griffith.

This does not appear to have been collected since Griffith originally found it (1845) at Malacca. It is a very well-marked species, and Griffith's original description of it is, in all respects except that of fruit, full and clear.

13. *DYSOXYLUM DENSIFLORUM*, Miq. in Ann. Mus. Lugd. Bat. IV, 9. A tree 20 to 40 feet high. *Leaves* unequally pinnate, 15 to 20 in. long, their petioles and rachises angular, deciduously puberulous. *Leaflets* 11 to 13, opposite or alternate ; the terminal larger than the others ; more or less obovate and with a longer petiolule ; lateral leaflets elliptic or elliptic-oblong, slightly oblique, acute or shortly acuminate, the base rounded or sub-cuneate and unequal, both surfaces glabrous ; main nerves 10 to 12 pairs, spreading, curved, slightly prominent beneath ; length 4·5 to 7 in., the terminal 1 or 2 in. longer ; breadth 2 to 2·5 in., the terminal sometimes 3 in. ; petiolules ·15 in., the terminal ·75 to 1 in. *Spikes* in clusters from woody tubercles on the stem, 1 to 2 in. long, tawny-tomentose. *Flowers* (in bud only), about ·15 in. long, sub-globular, their pedicels slightly shorter with bracteole at the base. *Calyx* almost as long as the petals, campanulate, coarsely pubescent, its mouth with 4 large irregular teeth. *Petals* 4, free, slightly imbricate, sub-orbicular (in bud), the apex slightly inflexed. *Staminal-tube* nearly as long as the petals, glabrous, widely tubular, divided almost to the base into 8 broad sub-truncate erose teeth ; *anthers*

8, included, elongate-elliptic, alternate with the lobes. *Disc* cylindric, short but longer than the ovary, thinly fleshy, crenulate, glabrous. *Ovary* depressed, 4-celled, sericeous as is the base of the short stout style; *stigma* slightly exserted, discoid. *Fruit* (young) narrowly obovoid, shortly apiculate, narrowed at the base into a pseudo-stalk, obscurely 4-angled, densely but minutely tawny-tomentose, 1.5 in. long, including the pseudo-stalk. C. DC. Monog. Phan. I, 499. *Epicharis densiflora*, Blume Bijdr. 167; Miq. Flor. Ind. Bat. Vol. I, pt. 2, p. 539. *Epicharis altissima*, Blume ex Miq. l.c. *Guarea densiflora*, Spreng., Syst. IV, 251.

Perak: King's Collector, Nos. 4934, 8826, 10093 and 10443. Wray No. 437. Scortechini, No. 1661. DISTRIB. Java, Sumatra.

In the youngest stages the fruit is ovoid: as it ripens it becomes obovoid and the base becomes narrowed into a pseudo-stalk.

14. *DYSOXYLUM CUNEATUM*, Hiern in Hook. fil. Fl. Br. Ind. I, 551. A large tree. *Leaves* 18 to 30 in. long, unequally pinnate; leaflets about 13, sub-coriaceous, opposite or sub-opposite, elliptic-oblong, shortly cuspidate; the base cuneate, unequal-sided; both surfaces glabrous, the lower punctate; main nerves 14 to 17 pairs, spreading, slightly prominent beneath when dry; length 4 to 7 in., breadth 2 to 3 in.; petiolules .15 in., stout, that of the terminal leaflet .75 in. *Spikes* cinereous-tomentose, only a few inches long in flower, but elongating much in fruit, (from the branches below the leaves?) clustered. *Flowers* .35 in. long, sub-sessile, bracteolate. *Calyx* half as long as the petals, campanulate, with 4 obtuse irregular deep teeth, pubescent. *Petals* 4, oblong, sub-imbricate, sub-glabrous. *Staminal-tube* longer than the petals, glabrescent outside, villous inside, the mouth with 8 obtuse shallow teeth. *Anthers* 8, shortly ovate, included. *Disc* membranous, tubular, about as long as the ovary, glabrous outside, pubescent inside, its mouth minutely crenulate. *Ovary* ovoid-conic, pilose; style cylindric, sparsely pilose in the lower part, glabrous above, *stigma* discoid with an annulus at its base. *Fruiting-spike* half as long as the leaves: ripe fruit sub-globose, about 1 in. in diam., sub-glabrous, the pericarp splitting into about 4 valves; seeds oblong, plano-convex, .75 in. long, C. DC. in Mon. Phan I, 496.

Malacca: Maingay (Kew DISTRIB.), No. 322-2.

Known only by Maingay's scanty specimens; allied to *D. cauliflorum* in inflorescence flowers and fruit.

15. *DYSOXYLUM RACEMOSUM*, King n. sp. A shrub, all parts glabrous except the young shoots and the inflorescence. *Leaves* 12 to 18 in. long, equally pinnate. *Leaflets* membranous, alternate, elliptic-oblong, the apex shortly acuminate, the base broad, slightly unequal; main nerves 8 to 10 pairs, curving, spreading, slightly prominent beneath,



length 5 to 8 in., breadth 2·25 to 3 in., petiolules ·25 in. *Racemes* slightly supra-axillary, solitary, 4 to 5 in. long, puberulous. *Flowers* scattered, ·2 in. long, on slightly shorter thick bracteolate pedicels. *Calyx* a shallow puberulous cup with 4 obscure shallow lobes. *Petals* 4, much longer than the calyx, elliptic, slightly oblique, the apices slightly concave and thickened, the bases truncate, puberulous on both surfaces. *Staminal-tube* slightly shorter than the petals and style, widely cylindric, sparsely puberulous, the mouth with 8 broad 3-toothed lobes. *Anthers* shortly ovate, their apices exerted. *Disc* slightly longer than the ovary, shortly cylindric, fleshy, glabrous, crenulate. *Ovary* hemispheric, densely puberulous, tapering into the thick style. *Stigma* subcapitate, with an annular disc at its base. *Fruit* ovoid, deciduously rusty-puberulous with round smooth pits, the pericarp leathery; length 1·5 to 2 in., diam., ·9 to 1·35 in.

S. Andaman and Nicobar Islands; King's Collectors.

This bears, especially in its inflorescence, a resemblance to *D. grande*, Hiern; but this is quite glabrous, while that has leaves very pubescent beneath; the fruit also is different.

Var. *arborea*; 20 feet or more in height, leaves up to 20 in. long, leaflets often much narrowed to the base, longer and with more nerves; spikes often 12 in. long.

16. *DYSOXYLUM MICROBOTRYS*. King n. sp. A tree 40 to 60 feet high. *Leaves* 12 to 20 in. long, equally pinnate, their petioles and rachises glabrescent or glabrous; leaflets thinly coriaceous, opposite, about 3 pairs, elliptic or elliptic-oblong, broadly cuspidate, the base cuneate, both surfaces glabrous; main nerves 9 to 11 pairs, oblique, rather straight, slightly prominent beneath when dry; length 6 to 10 in., breadth 2·5 to 3·5 in., petiolules ·25 to ·35 in. *Cymes* spike-like, solitary, extra-axillary, 4 to 8 in. long, few-flowered. *Flowers* ·6 in. long, usually solitary, on pedicels ·15 in. long, bracteolate at the base. *Calyx* a shallow slightly 4-toothed puberulous rugulose cup. *Petals* 4, puberulous, oblong, slightly widened at the base; the apex sub-acute, thickened and incurved. *Staminal-tube* slightly shorter than the petals and style, everywhere puberulous; its mouth not expanded but with many broad shallow obscure teeth. *Anthers* 8, narrowly elliptic, inserted about their own length below the mouth. *Disc* longer than the ovary, tubular, puberulous; the mouth thickened, rugulose, pilose. *Ovary* ovoid-conic, pubescent; *style* 4-angled, pubescent in its lower, glabrous in its upper, half; *stigma* discoid, with a narrow annular band at its base, 4-celled, each cell with 2 ovules. *Fruit* pyriform, the top often much flattened, 1·5 to 2 in. long, and from 1·25 to 1·5 in. in diam., sub-glabrous, the pericarp rather thick. *Seeds* about ·75 in. long, plano-convex.

Perak: King's Collector, Nos. 10551, 10580, and probably also No. 10181.

17. *DYSOXYLUM FLAVESCENS*, Hiern in Hook. fil. Fl. Br. Ind. I, 549. A tree. *Leaves* 1 to 2 feet long; leaflets 9 to 13, membranous, alternate, elliptic, oblique, shortly acuminate, glabrous; the base slightly oblique, rounded; main nerves numerous, sub-horizontal, very indistinct on both surfaces, the midrib prominent especially on the lower; length 3 to 5 in., breadth 1.25 to 2 in., petiolules .2 to .25 in. *Spikes* axillary, 2 to 4 in. long. *Flowers* crowded, .35 in. long, sub-sessile, 4-merous, puberulous. *Calyx* very short, nearly flat, 4-toothed, roughly puberulous. *Petals* 4, minutely pilose outside, glabrous inside, slightly imbricated, pale yellow. *Staminal-tube* glabrous below, slightly pilose above, its mouth crenate. *Anthers* 8 or 10, ovate, included. *Disc* glabrous, exceeding the ovary, dull reddish-orange, its mouth entire or undulate. *Ovary* minutely 4-furrowed, hairy, 4-celled; style cylindrical, hairy; *stigma* discoid. C. DC. in Mon. Phan. I, 494.

Malacca: Maingay (Kew Distrib.), No. 321.

This is known only by Maingay's scanty and incomplete specimens. The preceding description is largely taken from Maingay and Hiern.

18. *DYSOXYLUM ANDAMANICUM*, King n. sp. A tree 20 to 30 feet high. *Leaves* 6 to 10 in. long, unequally pinnate, the petiole and rachises angled, very pale when dry; leaflets 3 to 5, membranous, alternate, oblong to ovate, slightly oblique, shortly and bluntly acuminate, the base cuneate or rounded, both surfaces glabrous; main nerves 6 to 10 pairs, spreading: length 3 to 5 in., breadth 1.35 to 1.75 in., petiolules .25 in. *Spikes* slightly supra-axillary, 1 to 2 in. long, few-flowered, puberulous. *Flowers* .35 in. long, their pedicels about 2 in., puberulous. *Calyx* a shallow minutely 4-toothed glabrous cup. *Petals* 4, much longer than the calyx and slightly imbricate, oblong, sub-acute, convex at the apex, pale puberulous especially externally, reflexed, rarely deciduous. *Staminal tube* shorter than the petals, widely cylindric, slightly inflated near the base, slightly puberulous, the mouth with 9 or 10 broad erose teeth. *Stamens* 8 to 10, alternate with the teeth; *anthers* shortly ovate, slightly exserted. *Disc* fleshy, annular, crenulate, shorter than and adherent to the ovary at its base. *Ovary* conic, densely white pubescent, tapering into the stout style; *stigma* included, discoid with a small annulus at its base. *Fruit* depressed-globular, obscurely 3-grooved, glabrous, the pericarp thickly coriaceous, 1.25 in. in diam. *Seeds* 2 or 3, elliptic.

South Andaman: King's Collector.

19. *DYSOXYLUM RUGULOSUM*, King n. sp. A tree 15 to 25 feet high:



young branches with striate pale brown bark. *Leaves* 8 to 12 in. long, equally pinnate, the petiole and rachis shorter than the uppermost pair of leaflets; leaflets 2 pairs, the upper pair much the larger, opposite, thickly membranous, pale and minutely rugulose when dry, oblong-oblongate, shortly and abruptly acuminate, the base much narrowed; main nerves 8 to 14 pairs, spreading or ascending, faint on the upper surface, prominent and almost winged on the lower: length of the lower pair 3·5 to 4·5 in., breadth about 1·5 in., length of the upper pair 6 to 8 in., breadth about 2·25 in.; petiolules about ·15 in., stout. *Racemes* supra-axillary, ·5 to ·75 in. long, 3- or 4-flowered, puberulous. *Flowers* ·2 in. long, their pedicels shorter. *Calyx* almost flat, 4-cornered, rugulose outside and puberulous, inside glabrous and reticulate. *Petals* 4, much longer than the calyx, elliptic, puberulous outside, glabrous inside, the apex sub-acute slightly thickened and inflexed, the base truncate. *Staminal tube* shorter than the petals, cylindric, slightly ridged and puberulous outside, glabrous inside, the mouth with 8 or 9 broad shallow emarginate teeth; *anthers* elliptic, not exserted. *Disc* shortly cylindric, slightly exceeding the ovary, fleshy, glabrous 8-or 9-toothed. *Ovary* hemispheric, ridged, puberulous, tapering into the long cylindric puberulous style; *stigma* exserted, discoid, with a broad annulus at its base. *Fruit* on a short stout pedicel, pyriform, apiculate, with numerous vertical rugae, puberulous, 1·25 in. long, and ·8 in. in diam. at the broadest part.

Perak: King's Collector, Nos. 2863, 3158, Scortechini.

This resembles *D. macrocarpum*, Bl. in its leaves, but its flowers are much smaller and are in short racemes, not in panicles.

20. *DYSOXYLUM PAPILLOSUM*, King n. sp. A shrub 6 to 8 feet high; young branches rather stout, densely tawny-tomentose. *Leaves* 12 to 18 in. long, equally pinnate, their petioles and rachises tomentose, more or less angled; leaflets 2 or 3 pairs, the upper pair the largest, opposite or sub-opposite, coriaceous, broadly oblanceolate, shortly acuminate, tapering from above the middle to the very narrow base; both surfaces when dry minutely papillose, many of the papillae and especially those on the upper surface with perforated apices; the upper surface glabrous, olivaceous green when dry; the lower yellowish-brown, the main nerves and midrib pubescent; main nerves 10 to 15 pairs, prominent on the lower, depressed on the upper surface when dry; length 6 to 12 in., breadth 2·25 to ·5 in., petiolules only ·15 in., stout, tomentose. *Spikes* extra-axillary, ·75 to 1·25 in. long, the rachis stout, woody, tomentose. *Flower-buds* globose, ·15 in. in diam., on very short thick pedicels. *Calyx* campanulate, enveloping the petals, 4-toothed, membranous, densely tomentose externally. *Petals* 4, fleshy, broadly

ovate, with truncate bases and sub-acute apices, concave, densely adpressed-pubescent outside, glabrous inside. *Staminal tube* much shorter than the petals, cylindric, rather fleshy, glabrous, the mouth with 8 broad shallow emarginate teeth: *anthers* 8, oblong, longer than the tube, much exerted. *Disc* (if any) very small. *Ovary* broadly ovoid, tapering into the short thick style which is sparsely pilose towards the base: *stigma* thick, discoid, depressed in the centre. *Fruit* unknown.

Perak: King's Collector, No. 10755.

The disc in this plant, if present at all, must be very small, for I cannot detect it in the bud. In spite of this I refer it to *Dysoxylum*, of which it has the general facies. The shrubby habit, short thick spicate inflorescence, globular flower-buds, and the occasionally perforated leaves make this a remarkable and easily recognisable plant.

## 6. AMOORA, Roxb.

Trees. *Leaves* usually unequally-pinnate; leaflets oblique, quite entire. Flowers in axillary subdioecious panicles, the females sometimes spicate or racemose. *Calyx* 3-5-partite or -fid. *Petals* 3, thick, concave, imbricated. *Staminal tube* sub-globose or campanulate, entire or inconspicuously 6-10-crenate; *anthers* 3-10, included. *Disc* obsolete. *Ovary* sessile, short, 3-celled; cells 1-2-ovuled, stigma sessile. *Capsule* sub-globose, coriaceous, 3-celled and -seeded, loculicidally 3-valved, or indehiscent. *Seeds* in a fleshy aril, with ventral hile.—DISTRIB. A genus of about 25 species occurring only in India and the Malay Archipelago, and also 1 endemic species in Australia.

The Indian species of *Amoora*, as this genus is understood by the most recent botanical writers, fall into two groups. One of these (the old genus *Aphanamixis*) is a very natural one. In this group the male flowers are in panicles with divergent racemose or spicate branches, while the female flowers are in short racemes. The flowers of both sexes have a 5-merous calyx, and a 3-merous corolla, 3 or 6 stamens, 3-celled ovaries and 3-celled loculicidally dehiscent capsular fruits. The other group, named *Pseudo-Aglaiia* by M. C. de Candolle, consists of a number of species with from 6 to 10 stamens, 3-celled-ovaries, and large stigmas. Some of these have 3 petals, others have 4 or 5. As regards fruit some of them (*e.g.*, *A. cucullata*) have a 3-celled capsule like that of *Aphanamixis*: others have fruits which show no evidence of dehiscence. In treating this genus, I have excluded all the species having more than 3 petals, and I have abandoned dehiscence in the fruit as a diagnostic character. In the note under the genus *Aglaiia*, I have explained the change which I have made in the staminal character of that genus. I may here add that *Amoora Chittagonga*, Hiern, is certainly an *Aglaiia*; and that *Amoora decandra* Hiern, with its 10 anthers in two rows, and 5-celled ovary and fruit, is more of a *Lansium* than an *Amoora*.



Section I. Male flowers in panicles, female flowers in short spikes or racemes, sepals 5, petals 3; fruit 3-celled, capsular, loculicidal.

Stamens 3 ... 1. *A. Sumatrana.*

Stamens 6 ...

Male flowers .15 in. long ... 2. *A. Rohituka.*

Male flowers .3 in. long ... 3. *A. Aphanamixis.*

Section II. Male and perfect female flowers mixed in the same panicles: calyx cupular, 3-toothed, petals 3, anthers 6 or 10; fruit 3-celled, but not in all cases dehiscent.

Stamens 6 ...

Leaflets cordate and slightly oblique at the base, minutely rusty-tomentose

beneath: flowers .25 in. long ... 4. *A. rubiginosa.*

Leaflets sub-cuneate at the base, minutely puberulous and lepidote beneath;

flowers less than .1 in. long ... 5. *A. lanceolata.*

Leaflets sub-falcate and very oblique at the base, everywhere glabrous; flowers

.15 in. long, obovoid ... 6. *A. cucullata.*

Leaflets caudate-acuminate, the base rounded or cuneate, oblique, everywhere glabrous: flowers .2 in. long, staminal tube cylindric ...

7. *A. Ridleyi.*

Stamens 10 ...

Panicles 12 to 20 in. long, cinereous-scurfy; leaflets with broad bases;

flowers .15 in. long ... 8. *A. Wallichii.*

Panicles 8 to 10 in. long, rusty-puberulous; leaflets narrowed at the base;

flowers .1 in. long ... 9. *A. rubescens.*

1. AMOORA SUMATRANA, Miq. in Ann. Mus. Lugd. Bat. IV, 35. A tree 12 to 20 feet high; young branches stout, lenticellate, glabrous. Leaves 20 to 30 in. long, glabrous, unequally pinnate; leaflets 9 to 13, elliptic to elliptic-oblong, or oblanceolate-oblong, sub-coriaceous, shortly cuspidate, entire, the base more or less cuneate: main nerves 9 to 20 pairs, spreading; length 3 to 10 in., breadth 1.5 to 3.75 in. Male flowers .15 in. long, obovoid, in solitary extra-axillary panicles nearly as long as the leaves, their branches 1.5 to 6 in. long, spreading or drooping: the flowers numerous but not crowded, each with a minute acuminate bracteole, the pedicels half as long as the flower, rather stout. Sepals 5, unequal, the two larger nearly half as long as the petals, rotund, the edges erose-fimbriate, the inner surface glabrous, the outer pubescent.

*Petals* 3, thick, rotund, very concave and much imbricate, glabrous inside, sometimes puberulous outside. *Staminal column* fleshy, globular-ovoid, obscurely 3-angled, the mouth almost closed; anthers 3, broadly elliptic, narrowed to the apex, shortly apiculate; rudimentary ovary minute, conical, on a small pubescent disc. *Female flowers* unknown; the fruit in simple spikes as long as or longer than the leaves, pinkish when ripe, shortly pedicellate, sub-globular, 3-celled, 3-seeded, dehiscent, about .75 in. in diam.; the *seeds* ovoid, compressed, with a scarlet arillus. C. DC. Monogr. Phaner. I., 581.

Perak: Scortechini, Wray, King's Collector. Penang: Curtis, King. Distrib. Sumatra.

This species resembles *A. Rohituka*, W. and A., but it is a smaller tree, the male flowers have only 3 stamens, and the petals are pink. The Perak specimens agree with those in the Leiden Herbarium from Sumatra on which Miquel founded the species. Miquel in his description does not mention that the plant is triandrous,—a character by which it can at once be recognised.

2. AMOORA ROHITUKA, W. and A. Prod. 119. A tree from 30 to 70 feet high; young branches stout, lenticellate, at first puberulous, afterwards glabrous. *Leaves* 1 to 3 feet long, unequally pinnate, the petioles puberulous; leaflets 9 to 15, sub-coriaceous, opposite, oblong to elliptic-oblong, shortly and bluntly acuminate, entire; the base narrowed, often oblique; both surfaces glabrous: main nerves 12 to 15 pairs, spreading; length 3 to 9 in., breadth 1.75 to 3.5 in., petiolule .2 to .3 in. *Male flowers* about .15 in. long, sub-globular, in solitary axillary panicles more than half as long as the leaves, the branches about 3 in. long, spreading at right angles or slightly drooping; the flowers numerous, each with a minute scale-like bract, the pedicels short, stout. *Calyx* very short, spreading, with 5 or 6 small reniform sepals, pubescent. *Petals* 3, much larger than the calyx, orbicular, concave, glabrous or puberulous on the outer surface. *Staminal tube* nearly as long as the petals, sub-globular, with a small opening at the apex showing the slightly protruding apices of the anthers: *anthers* 6, sub-sessile, narrowly elliptic, attached to the tube near its base; rudimentary ovary ellipsoid, boldly 3-angled. *Female flowers* larger than the males, in axillary or slightly supra-axillary, solitary, often puberulous spikes much shorter than the leaves. *Sepals* sometimes more pubescent than in the male: petals as in the male, the anthers narrower. *Ovary* sub-globular or ellipsoid with a 3-lobed stigma: disc hypogynous, broadly conical, tawny-pubescent. *Fruit* sub-globular, yellow when ripe, 1 to 1.5 in. in diam.; the pericarp coriaceous, smooth, 3-celled, opening by 3 valves: *seed* oblong with a scarlet arillus. Hiern in Hook. fil. Fl.



Br. Ind. I, 559; C. DC. Monogr. Phan. I, 581; Kurz For. Flor. Burma I, 220; Trimen Flora Ceyl. I, 249; Bedd. Fl. Sylvat. t. 132; Brandis For. Fl. 69. *Andersonia Rohituka*, Roxb. Hort. Beng. 87; Fl. Ind. ii, 213. *Sphærosacme polystachya*, Wall. Cat. 1277. *Aglaia?* *polystachya*, Wall. in Roxb. Fl. Ind. ed. Carey, ii. 429. *S. spicata*, Wall. Cat. 4895. *Buchanania spicata*, Hb. Roxb. ex Wall. l. c. *Meliacea Wightiana* Wall. Cat. 4888. *Amoora macrophylla*, Nimmo in Grah. Cat. Bomb. Pl. 31. *Andersonia Rohitoca*, Griff. Notul. iv. 507; Ic. Pl. Asiat. iv. t. 589, f. 3.

Perak: not uncommon. Malacca; Griffith (Kew Distrib.) 1051; Maingay (Kew Distrib.) 341; King's Collector, many numbers. Andamans; King's Collector. Distrib. Sumatra; Forbes, No. 1734.

3. AMOORA APHANAMIXIS, Schultes fil. Syst. VII, 1621, Phan. I, 581. A tree 20 to 30 feet high; young branches rusty puberulous, ultimately glabrous and (when dry) black. Leaves 15 to 25 in. long, unequally pinnate; leaflets 11 to 17, sub-coriaceous, oblong, oblong-obovate to elliptic, shortly and obtusely cuspidate; the base rounded, very unequal-sided; glabrous when adult; main nerves 10 to 12 pairs, slightly prominent beneath; length 4 to 6 or even 8 in., breadth 2 to 2.75 in.; petiolules stout, .15 to .25 in. long. Panicles slightly supra-axillary, shorter than the leaves, puberulous, those with male flowers with numerous short divaricating rather distantly-flowered racemose branches. Flowers on very short pedicels, sub-globose, about .25 in. in diam. Calyx cupular, with 5 rounded imbricate sepals, thickened in the lower half and puberulous outside. Petals 3, thick, rotund, concave, much larger than the sepals, glabrous. Staminal tube shorter than the petals, fleshy, glabrous, ovoid, with a small entire mouth; anthers 6, elliptic, included. Ovary depressed, 3-celled, glabrous; stigma elongate, conical, fluted. Female flowers in rigid, unbranched or only slightly branched racemes, sessile like the males but with larger ovaries. Fruit ovoid-globose (ripe example not seen), glabrous. Miq. Fl. Ind. Bat. I, pt. 2. p. 535: Ann. Mus. Lugd. Bat. IV, 34. *Amoora grandifolia*, C. DC. Monogr. Phan. I, 581. *Aphanamixis grandifolia*, Bl. Bijdr. 165.

Under cultivation the leaves of this species often attain much greater size than the measurements given above.

4. AMOORA RUBIGINOSA, Hiern in Hook. fil. Fl. Br. Ind. I, 561. A tree 80 to 100 feet high; young branches stout, rusty-puberulous and scurfy. Leaves 18 to 24 in. long, equally pinnate; leaflets 8 to 10 pairs, opposite or alternate, coriaceous, oblong or elliptic-oblong, sub-acute or shortly acuminate, the base cordate and slightly oblique; upper surface glabrous, shining, the lower densely covered by minute rusty

tomentum with a few superficial stellate hairs; main nerves 20 to 24 pairs, spreading, prominent beneath; length 5 to 9 in., breadth 1·25 to 2·75 in.; petiolules about ·15 in. long, bent. *Panicles* solitary, axillary, more than half as long as the leaves, scurfily rusty-puberulous, the peduncles long, branches few with short racemose branchlets. *Flowers* on short pedicels, buds narrowly ovoid, ·25 in. long. *Calyx* shortly campanulate, rusty-tomentose outside, with 3 broad blunt spreading teeth. *Petals* 3, larger than the calyx, obovate-rotund, thick, glabrous. *Staminal tube* slightly shorter than the petals, narrowly ovoid, the mouth narrow and obscurely toothed; *anthers* 6, elliptic, included. *Ovary* broadly ovoid, depressed, 3-angled, tawny-pubescent, crowned by the glabrous ovoid, 6-angled stigma. *Fruit* sub-globose, apiculate, red when ripe, rusty-puberulous, 2 to 3 in. in diam., the pericarp pulpy. *Seeds* narrowly ellipsoid, about 1 in. long. C. DC. Monogr. Phan. I, 585. *Aphanamixis rubiginosa*, Griff. MSS.

Malacca, Griffith, No. 1050: Maingay, No. 340 (both of Kew Distrib.). Perak: King's Collector. Singapore, Ridley, No. 3790.

5. *AMOORA LANCEOLATA*, Hiern in Hook. fil. Fl. Br. Ind. I, 560. A tree; young shoots minutely rusty-puberulous. *Leaves* 6 to 10 in. long, unequally pinnate. *Leaflets* about 17, sub-coriaceous, opposite or nearly so, narrowly oblong-lanceolate, bluntly acuminate, entire, the base sub-cuneate; upper surface quite glabrous, the lower very minutely puberulous and lepidote; main nerves very faint, about 25 pairs, spreading; length 2 to 3 in., breadth ·6 to ·75 in., petiole ·2 in. *Panicles* of *male flowers* axillary, solitary, nearly as long as the leaves, the branches spreading, 1·25 to 2 in. long, many-flowered. *Male flowers* less than ·1 in. long, ovoid, on very short pubescent pedicels. *Calyx* cupular, with 3 shallow teeth, pubescent. *Corolla* much larger than the calyx; petals 3, concave, glabrous inside, puberulous outside. *Staminal tube* shorter than the *petals*, globular, glabrous, the mouth deeply 6-toothed; *anthers* 6, included, opposite the teeth, narrowly-elliptic; rudimentary. *Ovary* conical, 3-angled, puberulous. *Female flowers* and fruit unknown. C. DC. in Monogr. Phan. I, 584.

Malacca; Maingay (Kew Distrib.), No. 343.

6. *AMOORA CUCULLATA*, Roxb. Corom. Pl. III, 54, t. 258. A glabrous tree 30 to 40 feet high. *Leaves* 12 to 15 in. long, unequally pinnate; leaflets 5 to 9, thinly coriaceous, opposite, oblong-elliptic, sub-falcate, sub-acute, very oblique at the base: main nerves indistinct, numerous, spreading, the midrib strong; length 3 to 5 in., breadth 1·2 to 1·5 in., petiolule ·3 in. *Male panicles* about equal to the leaves, axillary, with lax, spreading, corymbiform, sparsely lepidote branches. *Flowers* ·15 in. long, obovoid. *Calyx* cupular, lepidote outside, with 3 broad blunt



teeth. *Petals* 3, longer than the calyx, glabrous, broadly elliptic, the apex blunt and concave. *Staminal tube* shorter than the petals, obovoid, its mouth with 6 shallow broad blunt erose teeth; *anthers* 6, elliptic, included, attached half-way up the tube; *rudimentary ovary* broadly ovoid, sub-truncate. *Female flowers* a little larger than the males, but in few-flowered supra-axillary racemes about 2 in. long; *Calyx*, corolla, staminal tube and anthers as in the male; ovary ovate, 3-angled, lepidote, 3-celled: stigma sessile, large, 3-lobed. *Fruit* depressed-globular, 2·5 in. in diam., dehiscing by 3 valves, the pericarp leathery. *Seeds* 3, rounded trigonous, with an orange-coloured arillus. Kurz For. Flora Burma I, 221; C. DC. Monogr. Phan. I, 583; Hiern in Hook. fil. Fl. Br. Ind. I, 560: Bedd. Fl. Sylv. 55; Miq. Ann. Mus. Lugd. Bat. IV, 37; Dalz. and Gibs. Fl. Bomb. 37. *Andersonia cucullata*, Roxb. Hort. Beng. 82; Fl. Ind. II, 212. *Sphaerosacme Rohituka*, Wall. Cat. 1278. *Amoora auriculata*, Miq. MSS.

Perak: Scortechini. Singapore: Ridley. Distrib. Borneo, Korthals: Burma, Khasia Hills, Delta of Ganges, Nepal.

7. *AMOORA RIDLEYI*, King n. sp. A tree 50 to 60 feet high; young branches stout, minutely cinereous-puberulous. *Leaves* 18 to 24 in. long, unequally pinnate; leaflets 11 to 17, sub-opposite or opposite, sub-coriaceous, oblong-lanceolate to ovate-lanceolate, caudate-acuminate; the base rounded or cuneate, very unequal; both surfaces glabrous, the lower sub-glaucous; main nerves 8 to 13 pairs, spreading, slightly prominent on the lower surface: length 3·5 to 6 in., breadth 1·35 to 2 in., petiolules ·25 to ·4 in. *Panicles* axillary, solitary, about half as long as the leaves, stellate-pubescent, on long peduncles, much branched, the ultimate branchlets cymulose. *Flowers* ·2 in. long, narrowly ovoid, on bracteolate pedicels nearly as long as themselves. *Calyx* rather deeply cupular, tomentose outside, the mouth with 3 shallow broad teeth. *Petals* 3, longer than the calyx, fleshy, broadly elliptic, with very concave blunt apices, pubescent in the lower half outside, otherwise glabrous. *Staminal tube* much shorter than the *petals*, glabrous outside, with a few scattered hairs inside, cylindric, with a wide mouth with 6 broad shallow teeth; *anthers* 6, narrowly elliptic, their apices exserted; *ovary* depressed, densely pubescent, 3-celled; *stigma* glabrous, large, pyramidal, deeply grooved. *Fruit* globular, minutely rusty-tomentose, 2·5 in. in diam. when ripe, indehiscent, usually with 2 seeds 1·75 in. in length; peduncle, stout, ·5 in. long.

Perak: King's Collector, Nos. 5383, 5918, 6060, 7917; Wray, No. 2107. Pahang: Ridley, No. 5027.

8. *AMOORA WALLICHII*, King. A tree: young branches stout, minutely rusty-puberulous. *Leaves* 15 to 24 in. long, unequally pinnate:

leaflets 11 to 13, sub-coriaceous, opposite or sub-opposite, narrowly oblong, sub-acute, the base rounded or slightly cuneate, slightly oblique; both surfaces glabrous: main nerves 16 to 18 pairs, prominent on the rather pale under surface: length 4·5 to 8 in., breadth 1·4 to 2 in., petiole .5 in. *Panicles* solitary, axillary, nearly as long as the leaves, with few rather distant lax alternate branches, the ultimate branchlets cymulose and slightly scurfy. *Flowers* .15 in. long, sub-rotund. *Calyx* a flat-tish cup with 3 broad shallow teeth, minutely tomentose externally. *Petals* 3, longer than the calyx, rotund, concave, much imbricate, minutely pubescent outside. *Staminal tube* spherical-obovoid, with 10 small acute teeth, glabrous; anthers 10, narrowly elliptic, their apices slightly exserted: rudimentary ovary depressed, tawny-pubescent, crowned by the thick fleshy 3-grooved stigma. *Female flowers* mixed with the males and exactly like them, but with a pyramidal, prominently 3-angled, tawny-pubescent, 3-celled ovary crowned by a stigma as in the male. *Fruit* obovoid, about 2 in. in diam., on a stout peduncle, its surface tawny-tomentose. *Sphaerosacme spectabilis*, Wall. MSS. in Herb. Calc. *Amoora spectabilis* Hiern (not of Miquel) in Hook. fil. Fl. Br. Ind. I, 561. Kurz For. Flora Burma I, 221.

Andaman Islands, King's Collectors. Distrib. Burma, Assam, Sikkim.

There has been some confusion in dealing with this plant. The description above given is that of Wallich's own specimen (in flower) taken from a tree grown in the Bot. Gard., Calcutta, which had originally been brought from Goalpara in Assam. Fruiting specimens have in more recent years been collected in Assam by Mr. Gustav Mann, for many years Conservator of Forests in that province. Flowering specimens exactly agreeing with Wallich's have also been brought from the Andaman Islands. Miquel has described (Ann. Mus. Lugd. Bat. IV, 37) under the name *Amoora spectabilis*, a plant of which he says *Sphaerosacme spectabilis*, Wall. is the type. But Miquel's description does not fit Wallich's plant at all. Mr. Hiern, taking Miquel's name *A. spectabilis*, describes under it a plant from Burmah which is certainly not Miquel's plant: but which may be the same as *Sphaerosacme spectabilis*, Wall.

9. *AMOORA RUBESCENS*, Hiern in Hook. fil. Fl. Br. Ind. I, 561. A tree 30 to 40 feet high; young branches stout, rusty puberulous. *Leaves* 18 to 30 in. long: leaflets 13 to 15, opposite, thinly coriaceous, oblong, sub-acute or obtuse, narrowed and oblique at the base, both surfaces glabrous; main nerves 8 to 10 pairs, ascending, rather prominent beneath; length 4 to 5·5 in., breadth 1·75 to 2·25 in., petiole .5 in. *Panicles* solitary, axillary, 8 to 10 in. long, rusty puberulous, the



branches spreading, the ultimate branchlets 2- to 3-flowered. *Flowers* on short pedicels, obovoid-rotund, .1 in. long. *Calyx* cupular, puberulous outside, with 3 broad blunt teeth. *Petals* 3, longer than the calyx, rotund, concave, slightly puberulous on the back and edges. *Staminal tube* broadly ovoid, the mouth wide and with 9 broad bifid teeth; *anthers* 10, elliptic, their apices exserted. *Ovary* depressed, tawny-pubescent, 3-celled: stigma large, cylindric, glabrous, sulcate. *Fruit* depressed-globular, mammillate, 2 in. in diam., minutely rusty puberulous, 3-celled (one cell abortive), pericarp thickly coriaceous, almost fleshy. C. DC. Monog. Phan. I, 589.

Singapore: Maingay Herb. prop. No. 3351 (Kew Distrib. No. 355). Perak: King's Collector, No. 5944; Wray, No. 2349. Penang: Curtis No. 2437.

The fruit when ripe is reddish-brown, according to Mr. Curtis.

#### 7. *AGLAIA*, Lour.

Trees or shrubs, glabrous, lepidote or stellately pubescent. *Leaves* pinnate or trifoliolate; leaflets quite entire. *Flowers* polygamo-diœcious, minute or small, numerous, paniculate, sub-globose. *Calyx* 5-lobed, imbricated in bud. *Petals* 5, concave, short, imbricated. *Staminal tube* urceolate or sub-globose, 5-toothed at the apex or entire; anthers usually 5, or 4 or 10, included or half-exserted, erect. *Disk* inconspicuous. *Ovary* ovoid or shortly so, 1-3-celled, with 2-1 ovules in each cell; style glabrous, short. *Berry* dry, 1-2-celled and-seeded. *Seeds* with a fleshy integument.—DISTRIB. Species about 70, Chinese, Indo-Malayan or Polynesian.

The genus *Aglaiia* is distinguished by its small flowers with 5-merous calyx and corolla, and depressed-globose or globose staminal tube. The calyx-lobes are often imbricate, and the petals are invariably so, three being outside or partly so, and two entirely covered by the outer three. To the genus, as limited by M. C. de Candolle and Mr. Hiern, only species of which the anthers are either 5 or 6 can be admitted. The effect of this limitation as to the number of the anthers is to force into *Amoora* various species which, taking the section *Aphanamixis* as the type of *Amoora*, have far less in common with that genus than with the 5-antherous species of *Aglaiia*. The result, as regards *Amoora*, is that that genus is loaded with a number of anomalous species collected together in a group under the sectional name *Pseudo-Aglaiia*. By relaxing the definition of *Aglaiia* so as to admit plants of which the flowers have 4, 8 or 10 stamens, and by limiting *Amoora* to plants with 3-merous corollas, it appears to me that both genera are greatly simplified. Dehiscence in the fruit cannot be regarded as a diagnostic character of *Amoora*, there being several Indian species in the fruit of which there is no evidence of dehiscence; but indehiscence in the fruit is an absolute character in *Aglaiia*. The effect of the change which I have ventured to carry into effect in the diagnoses of these two genera is, as regards the species described by Mr. Hiern in the Flora of British

India, to convert *Amoora Maingayi* Hiern into an *Aglaia*: *Amoora dysoxyloides*, Kurz is also removed to this genus.

STAMENS 4 ... .. 1. *A. fusca*.

STAMENS 5

*Leaves quite glabrous, and not lepidote on the lower surface.*

Leaves trifoliolate, 2·5 to 3 in. long, often shorter than the panicles; calyx with elliptic lobes: anthers elliptic, included... 2. *A. odorata*.

Leaves 3- to 5-foliolate, 5 to 9 in. long, always longer than the panicles; calyx with rounded teeth, puberulous outside; anthers broadly ovate and with the tips exerted... 3. *A. oligophylla*.

Leaves 5 to 8 in. long; leaflets 5 or more; all parts of the flower glabrous 4. *A. glabriflora*.

Leaves 7 or 8 in. long, leaflets 5 to 8, subglaucous beneath; sepals free, pubescent outside; flowers ovoid, ·1 in. long 5. *A. glaucescens*.

Leaves 6 to 12 in. long, leaflets 7 to 9, the calyx toothed, lepidote-pubescent outside; flowers depressed-hemispheric, ·05 in. in diam. ... 6. *A. Scortechinii*.

Leaves 12 to 24 in. long; leaflets about 15, brown when dry; calyx toothed, puberulous; flowers obovate, ·15 in. long 7. *A. Ganggo*.

Leaves 18 to 36 in. long; leaflets 11 to 13, pale when dry; calyx puberulous; flowers ·05 to ·075 in. in diam., depressed-globular ... 8. *A. leucophylla*.

*Leaflets glabrous above, lepidote but not pubescent on the lower surface.*

Flowers depressed-globular, not more than ·04 in. in diam., on pedicels as long as or longer than themselves.

Calyx with 4 or 5 long spreading unequal teeth nearly as long as the petals 9. *A. cinerea*.

Calyx with 5 orbicular blunt spreading lobes much shorter than the petals ... 10. *A. odoratissima*.

Flowers ovoid or obovoid-globose, ·05 in. or more in diam., on pedicels shorter than themselves.



Flowers ovoid, .08 in. long; calyx sub-campanulate, densely pubescent outside with 5 deep broadly ovate lobes; scales on under surface of leaflets minute and not shining ... 11. *A. Forbesii.*

Flowers ovoid, .05 in. long; calyx cupular, pale-coloured, almost glabrous, divided to the base into 5 shallow broad blunt lobes; scales on lower surface of leaflets shining ... 12. *A. squamulosa.*

Flowers obovoid-globose, .08 in. long; calyx with 5 broad shallow rounded spreading lobes minutely whitish tomentose with superficial stellate-hairy bright rusty scales; scales on lower surface of leaflets sparse stellate-hairy ... 13. *A. Kunstleri.*

*Leaflets more or less glabrous on the upper, pubescent on the lower surface.*

Panicles small with very short few-flowered branches ... 14. *A. humilis.*

Panicles condensed; flowers densely crowded, sessile.

Leaflets on the under surface covered with minute tomentum with stellate hairs intermixed, and with superficial shining scales; flowers sub-globular, petals orbicular ... 15. *A. argentea.*

Leaflets as in *A. argentea*, petals elliptic, flowers ovoid ... 15. *A. argentea.*  
*var. Curtisii.*

Leaflets tomentose on the lower surface, scales if any not shining; petals elliptic, flowers ovoid ... 15. *A. argentea.*  
*var. eximia.*

Panicles not condensed, their main branches spreading, the ultimate divisions short densely flowered spikes; flowers depressed-globular, sessile.

Flowers .1 in. in diam.,

Main nerves of leaves 28 to 36 pairs:

panicles 9 to 12 in. long ... 16. *A. lanuginosa.*

Main nerves of leaves 16 to 24 pairs;

panicles 6 to 8 in. long ... 17. *A. Curtisii.*

Flowers .025 to .4 in. in diam.

Calyx very tomentose and with 5 long narrow acute or sub-acute spreading unequal lobes some of them longer than the petals.

Leaves 4 to 9 in. long: leaflets not cordate at the base, 1.5 to 5 in. long; main nerves 6 to 11 pairs, spreading, fruit ellipsoid ... 18. *A. Palembangica.*

Leaves 7 to 15 in. long; leaflets minutely cordate at the base, 4 to 6 in. long; main nerves 10 to 14 in., oblique: fruit globular or ovoid ... 19. *A. cordata.*

Calyx much shorter than the petals and with broad short imbricate lobes.

Calyx quite glabrous ... 20. *A. Hiernii.*

Calyx pubescent outside; fruit pyri-form, 1.75 in. long ... 21. *A. Griffithii.*

Panicles lax, spreading; flowers not crowded, depressed-globular, globular or obovoid, sub-sessile or pedicelled.

Flowers sub-sessile, anthers exserted.

Flowers .035 in. in diam., depressed-globular, sub-sessile: calyx rotate and with 5 deep broad rounded membranous pubescent lobes: staminal tube short, cupular, sub-entire, glabrous. Fruit ovoid-globose, tapering into a pseudo-stalk, 1 in. long ... 22. *A. membranifolia.*

Flowers pedicelled, anthers included.

Flowers .05 in. long, globular, on pedicels longer than themselves. Calyx cupular with 5 acute spreading teeth stellate-pubescent outside. Staminal tube globular, inflated about the middle, glabrous, the mouth sub-entire: fruit obovoid, rugulose, about .4 in. long ... 23. *A. tenuicaulis.*

Flowers .06 in. long, obovoid, on pedicels shorter than themselves; Calyx cupular, pubescent outside, with 5 blunt rotund spreading lobes; staminal



tube obovoid, 5-toothed, puberulous;

fruit globular to ovoid, .4 to .6 in.

long ... 24. *A. trichostemon*.

STAMENS 7 TO 9.

Panicles 12 in. long : calyx with 4 broad

valvate unequal teeth ; stigma long, nar-

row, deeply 3-grooved, ovary 3-celled ... 25. *A. macrostigma*.

Panicles 2.5 to 6 in. long.

Calyx fleshy, pellucid-dotted, with 5

broad imbricate lobes : stigma thick,

cylindric, 2-lobed ; ovary 2-celled ... 26. *A. heteroclita*.

Calyx with 5 minute erect pointed teeth :

stigma capitate, 2- 3-angled ... 27. *A. andamanica*.

STAMENS 10 ... 28. *A. Maingayi*.

1. *AGLAIA FUSCA*, n. sp. King. A tree, young branches cinereous, at first covered with a thin layer of deciduous minute pale rusty scurfy tomentum, afterwards glaberulous. *Leaves* 6 to 10 in. long, equally or unequally pinnate ; leaflets coriaceous, alternate, sub-opposite (the upper pair opposite) oblong-lanceolate to ovate-lanceolate, shortly acuminate or acute, the base cuneate or sometimes rounded ; upper surface glabrous and shining ; the lower glabrous, minutely punctulate, the midrib rusty-puberulous ; main nerves 7 to 9 pairs, ascending ; length 2.5 to 4.5 in., breadth 1 to 1.75 in. ; petiolules .35 in., that of the odd leaf (when present) longer. *Panicles* axillary, solitary, much shorter than the leaves, with rather long peduncles, the branches few, the flowers rather crowded. *Flowers* globular, .05 in. in diam., on pedicels rather shorter than themselves. *Calyx* of 4 unequal rotund sepals, scaly externally. *Petals* 4, rotund, concave, glabrous, larger than the sepals. *Staminal tube* globular-obovoid, much thickened inside below each anther, glabrous, the mouth small annular, sub-entire ; *anthers* 4, shortly and thickly ovate, inserted near the mouth. *Ovary* (rudimentary) pubescent ; *stigma* long, cylindric, glabrous. *Fruit* globular with a small apiculus, minutely rusty-tomentose, .3 in. in diam. (not ripe), one-celled and one-seeded by abortion.

South Andaman : King's Collector.

In the fruit distinct remains of a second cell are found. The species is closely allied to *A. fuscescens*, but is distinguishable by its thicker narrower leaflets with midribs hairy below, much smaller flowers, and more globose staminal tube which appears never to have more than 4 anthers. Flowers with perfect pistils have not yet been found.

2. *AGLAIA ODORATA*, Lour. Fl. Coch. Chin. 173. A shrub or small tree ; young shoots slender, rusty stellate-lepidote. *Leaves* trifoliolate, 2.5 to 5 in. long ; leaflets thinly coriaceous, ovate- or obovate-oblong, the

apex obtuse or tapered to each end or sub-rhomboidal: the terminal one the largest and tapering into the petiole: both surfaces glabrous, minutely reticulate when dry: main nerves 6 to 8 pairs, curving, indistinct; length of lateral pair 1·25 to 2 in., of terminal one 2·5 to 3·5 in. *Panicles* often longer than the leaves, lax. *Flowers* ·1 in. long, on pedicels of about the same length, glabrous. *Calyx* with 5 deep elliptic lobes. *Petals* unequal, orbicular or sub-orbicular. *Staminal tube* campanulate, with 5 broad truncate teeth; *anthers* 5, elliptic, included. *Fruit* unknown.

Malacca, Penang and Singapore; but probably only cultivated. Distrib. China and Siam.

3. *AGLAIA OLIGOPHYLLA*, Miq. Fl. Ind. Bat. Suppl. 507. A small tree 15 to 20 feet high: young branches covered with deciduous cinereous scurf. *Leaves* 5 to 9 in. long, unequally pinnate, the petioles and rachises puberulous, soon becoming glabrous; leaflets 3 to 5, membranous, the pairs opposite, the terminal one the largest, obovate-oblong to elliptic, shortly and often bluntly acuminate, the base cuneate, sometimes oblique: both surfaces glabrous, reticulate when dry; main nerves 5 or 6 pairs, ascending, curving; length 3 to 6 in., breadth 1·5 to 2·5 in.; petiolules ·4 to ·5 in., swollen at the base. *Panicles* axillary, 1·5 to 4 in. long, at first scurfy, but ultimately sub-glabrous, much branched, bracteolate. *Flowers* ·075 in., in diam., on slender pedicels as long as themselves, globular. *Calyx* cupular, flat, with 5 spreading rounded concave teeth, puberulous externally, the edges ciliolate. *Petals* much longer than the calyx, orbicular, concave, glabrous. *Staminal tube* shorter than the petals, globular-turbinate, 5-grooved, the mouth with 5 broad blunt teeth; *anthers* 5, broadly ovate, the tips only exserted. *Ovary* depressed; *stigma* conical, pubescent. *Fruit* globular, with the calyx persistent at its base, densely and minutely tawny-pubescent, ·5 or ·6 in. in diam.; the pedicels stout, glabrous ·1 in. long. Kurz For. Flora Burma I, 220; C. DC. Monogr. Phaner. I, 607; Miq. Ann. Mus. Lugd. Bat. IV, 41. *Meliaceae Singapuriana?* *Walsura* Wall. Cat. 4887.

Singapore: Wallich. Perak: King's Collector, No. 3968. Distrib. Burmah, Helfer (Kew Distrib.), No. 1046. Sumatra.

4. *AGLAIA GLABRIFLORA*, Hiern in Hook. fil. Fl. Br. Ind. 1. 555. A glabrous tree 15 to 25 feet high. *Leaves* 5 to 8 in. long, unequally pinnate, the petioles and rachises angled: leaflets about 8 opposite and one odd, membranous, usually ovate, rarely lanceolate, bluntly acuminate, the base cuneate, rarely rounded; when dry the upper surface shining, the lower dull; main nerves 4 pairs, ascending, curving, obsolete on the upper, slightly prominent on the lower surface; length 2 to 2·75 in., breadth ·75 to 1·25 in., petiolules ·15 to ·2 in. *Panicles* solitary, axillary, spreading, 1·5 to 4 in. long. *Flowers* numerous, ·1 in. long, their



pedicels usually shorter but sometimes longer than themselves. *Calyx* cupular, fleshy, with 5 broad shallow rounded teeth. *Petals* 5, much longer than the calyx, ovate, concave, the edges thin. *Staminal tube* shorter than the petals, urceolate, the edge sub-entire; *anthers* 5, elliptic, subcordate, deeply included. *Ovary* short, depressed, pubescent; *stigma* long, cylindric, glabrous. *Fruit* reniform, compressed, cinerous, puberulous, 2-celled, 2-seeded, .6 in. in diam. C. DC. Monogr. Phaner. I, 608.

Malacca: Griffith, Nos. 1041, 1042. Maingay (Kew Distrib.) No. 336. Perak: King's Collector, Nos. 10617, 10724. Scortechini, No. 482. Singapore: Ridley, Nos. 1812, 3898.

5. *AGLAIA GLAUDESCENS*, n. sp. King. A shrub: young branches rather slender, the bark when dry cinereous lenticellate; while young covered with pale rusty minute scurfy tomentum. *Leaves* 7 or 8 in. long, equally or unequally pinnate: leaflets 5 to 8, thinly coriaceous, oblong or elliptic-oblong or obovate-oblong, sub-acute, the base cuneate, both surfaces glabrous, the upper shining, the lower dull and sub-glaucous; main nerves 8 to 10 pairs, ascending, rather straight, slightly prominent on the lower surface; length 3.5 to 5.5 in., breadth 1.75 to 2 in. (rarely 3 in.), petiolules .35 to .5 in. *Panicles* solitary, axillary, nearly as long as the leaves, branching from near the base, very lax, few-flowered. *Flowers* ovoid, .1 in., long, on pedicels about as long as themselves. *Calyx* of 4 or 5 ovate concave ascending sepals, pubescent externally. *Petals* 4 or 5, larger than the sepals, thick, elliptic, obtuse, glabrous. *Staminal tube* nearly as long as the petals, cylindric, widening at the sub-entire mouth; *anthers* 4 or 5, shortly and broadly ovate, attached near the apex of the tube, included. *Ovary* shortly and narrowly cylindric, pubescent, crowned by the glabrous cylindric stigma. *Fruit* unknown.

South Andaman Island: King's Collectors.

6. *AGLAIA SCORTECHINII*, King, n. sp. A tree; young shoots slender and, like the slender petioles, rachises, petiolules and inflorescences, with very minute brown scales. *Leaves* 6 to 12 in. long, unequally pinnate; leaflets 7 to 9, the pairs opposite, membranous, lanceolate or oblong-lanceolate, shortly acuminate, much cuneate at the base; both surfaces quite glabrous, pale brown when dry; the 7 to 10 pairs of main nerves indistinct; length 3.5 to 5 in. *Panicles* 7 to 9 in., the branches long, divaricating, lax. *Flowers* depressed-hemispheric, .05 in. in diam., on slender pedicels longer than themselves. *Calyx* short, spreading, with 5 deep orbicular concave lobes, lepidote-pubescent externally. *Petals* 5, orbicular or ovate-orbicular, concave, glabrous, much larger than the calyx. *Staminal tube* shorter than the petals, widely depressed-campanulate, the mouth with several broad much inflexed teeth, glabrous;



anthers 5, elliptic, included. Ovary small, depressed; stigma globose. Fruit unknown.

Perak: Scortechini, No. 722.

The nearest ally of this is *A. speciosa*, Blume, which, however, has leaflets of thicker texture, with more numerous and distinct nerves and squamulose on the under surface. The flowers of the two also differ slightly, those of *A. speciosa*, although similar in calyx and corolla, having a staminal tube with a wide open mouth, without inflexed teeth and from which the anthers are partly exerted.

7. *AGLAIA GANGGO*, Miq. Flor. Ind. Bat. Suppl. 506. A tree: young branches, petioles, midribs and inflorescences covered with minute rusty scales. Leaves 10 to 24 in. long, equally or unequally pinnate; leaflets 10 to 15, opposite or alternate, sub-coriaceous, narrowly oblong or oblong-lanceolate, shortly and rather abruptly acuminate; the base cuneate, unequal-sided: both surfaces free from hairs, but covered with very minute scale-like pustules: main nerves 12 to 18 pairs, faint, spreading: length 3 to 5.5 in., breadth 1 to 1.75 in., petiolule .15 to .35 in. Panicles solitary, axillary, nearly as long as the leaves, the lower branches distant, all more or less spreading, the flowers on the ultimate branchlets rather crowded. Flowers .1 to .15 in. long, ovoid, sub-sessile. Calyx cupular, minutely pubescent and scaly outside, the mouth with 5 broad blunt erect teeth. Petals 5, larger than the calyx, elliptic, concave, blunt, glabrous. Staminal tube shorter than the petals, ovoid, the mouth small, circular, not toothed; anthers 5, narrowly elliptic, included. Ovary small, depressed, 3-angled, densely hairy, crowned by the glabrous cylindric grooved stigma. Fruits on short stout pedicels, reniform, compressed, 2-celled, 2-seeded, minutely rusty-lepidote, .5 in. broad (perhaps not quite ripe). Miq. Ann. Mus. Lugd. Bat. IV, 47. C. DC. Phaner. Monogr. I, 27.

South Andaman, Nicobar Islands; King's Collector. Distrib. Sumatra.

The flowers of the Andaman specimens agree exactly with those from Sumatra on which Miquel founded the species which is a very distinct one. On each panicle, there appear to be certain flowers with perfect and others with imperfect ovaries. The panicles bearing fruit are thus in size and ramification exactly like those bearing flowers. *A. Forsteni*, a species founded by Miquel (Ann. Mus. Lugd. Bat. IV, 46) on specimens collected in Amboina does not appear to me to be really distinct from this. Under the name of *Aglaia Ganggo*, Miq., I believe there have been issued from the Calcutta Herbarium some specimens of a Perak plant (King's Collector, No. 4606), which much resembles this in leaves and inflorescence, but which has a very different staminal tube.



8. *AGLAIA LEUCOPHYLLA*, King, n. sp. A tree 40 to 60 feet high; all parts quite glabrous; young branches rather stout, pale, cinereous when dry and slightly rough. *Leaves* 2 to 3 feet long, unequally pinnate; the petioles very long, minutely rugulose when dry; leaflets 11 to 13, membranous, the lower alternate and distant, the upper opposite, oblong-lanceolate to elliptic-oblong or ovate, all with acuminate apices and cuneate bases, the lower half sometimes very narrow; main nerves 9 to 15 pairs, spreading, curving, invisible on the upper but distinct on the lower surface; length 6 to 12 in., breadth 1·25 to 3 in.; petiolules ·25 to ·6 in., slender. *Panicles* extra-axillary, slender, rugulose, the branches spreading but slightly. *Flowers* ·05 to ·075 in. in diam., depressed-globular, on pedicels longer than themselves. *Calyx* much smaller than the petals, pale-coloured, puberulous, with 5 deep acute or sub-acute spreading lobes. *Petals* 5, dark-coloured when dry (yellow when fresh), orbicular, concave, glabrous. *Staminal tube* turbinate, the mouth 5- or 6-lobed; *anthers* 5 or 6, broadly ovate, the connective slightly apiculate at the apex, the apices bent downwards and not exerted. *Ovary* broad, depressed, pubescent: *stigma* broadly ovoid, the apex sub-2-lobed. *Fruit* (not ripe), obovoid, with depressed sub-bi-lobed apex; the slightly enlarged calyx persistent at the base, minutely cinereous, tomentose.

Perak: King's Collector, Nos. 1874, 2998 and 6494. Wray, No. 2935.

There is some diversity in the size of the leaflets and of the flowers of this species. My collector's gathering No. 2998 above-quoted has narrowly oblong-lanceolate leaflets, and its flowers measure scarcely ·05 in diam.: while the flowers of No. 1874 are quite ·075 in. in diam., and the leaflets of all the other gatherings, except No. 2998, are either elliptic-oblong or ovate. I find that the structure of the flowers is alike whatever their size may be.

9. *AGLAIA CINEREA*, King, n. sp. A shrub 10 to 15 feet high: young branches petioles, rachises, petiolules and inflorescences with numerous minute brown scales. *Leaves* 7 to 12 in. long, unequally pinnate: leaflets 5 to 7, alternate and rather distant; the uppermost pair opposite, thinly coriaceous, oblong- or ovate-lanceolate, often oblique, the apex shortly acuminate, the base cuneate, that of the upper three much narrowed in the lower third; both surfaces cinereous when dry, the lower paler and sparsely covered with rusty stellate scales; main nerves 8 to 13 pairs, oblique, rather straight; length 2·5 to 6 in., breadth 1 to 1·75 in.; petiolules ·35 to ·6 in., that of the odd leaflet sometimes ·8 in. *Panicles* supra-axillary, slender, lax, 5 to 7 in. long, the branches divaricating. *Flowers* small, ·04 in. in diam., globu-

lar, on slender pedicels longer than themselves. *Calyx* with 4 or 5 long spreading unequal blunt lobes nearly as long as the petals, pubescent-lepidote externally. *Petals* 5, concave, rotund, unequal, glabrous. *Staminal tube* shorter than the petals, shortly campanulate with a truncate entire mouth, glabrous: *anthers* 5, shortly ovate, exserted. *Ovary* and stigma both depressed. *Fruit* pyriform with a long pseudo-stalk and on a short stout pedicel, minutely pubescent-lepidote, .75 in. long, and .4 in. diam. near the apex.

Malacca: Griffith. Perak: King's Collector, Nos. 2730 and 5285. Scortechini No. 347.

10. *AGLAIA ODORATISSIMA*. Blume Bijdr. 171. A tree 20 to 40 feet high: young branches petioles rachises petiolules and inflorescences with minute brown deciduous scales. *Leaves* 5 to 9 in. long, unequally pinnate; leaflets 5 to 7, oblong-lanceolate, rarely ovate, opposite, thinly coriaceous, shortly acuminate, the base cuneate or rounded; upper surface glabrous, greenish when dry, the lower brown, sparsely (the midrib and nerves rather densely) lepidote; main nerves 6 to 9 (rarely 11) pairs, ascending, curved; length 2 to 5 (occasionally 7) in.,; breadth 1 to 2 (occasionally 2.5) in.; petiolules .2 in., that of the terminal one sometimes .3 in., *Panicles* supra-axillary, solitary, 3 to 8 in. long, (occasionally 10 to 12) in., the branches divaricating, densely-flowered. *Flowers* depressed-globular, about .035 in. in diam., on pedicels about as long. *Calyx* cupular, or rather flat, short, with 5 orbicular blunt spreading lobes, pubescent-lepidote outside. *Petals* 5, much longer than the calyx, elliptic or obovate-rotund, unequal, blunt, concave, glabrous, sometimes granular outside. *Staminal tube* shorter than the petals, truncate-campanulate, the mouth open, obscurely 5-lobed: *anthers* broadly ovoid, inserted by a very short filament just below the mouth of the tube, exserted, or inflexed and therefore included. *Ovary* small, depressed, pubescent; *stigma* small, broadly ovoid. *Fruit* ovoid or sub-globose, densely covered with minute brown scales, about .6 in. long, and .4 in. in diam., usually 1-seeded. Miq. Fl. Ind. Bat. Vol. I, pt. 2, p. 544; Ann. Mus. Lugd. Bat. IV. 44. C. DC. Monogr. Phaner. I, 602. *A. Roxburghiana* Hiern, Fl. Br. Ind. I, 555 and C. DC. Monogr. Phaner. I, 604. (not of Miquel.) *Aglaia*? Wall. Cat. 9039 ? *A. sexipetala*, Griff. Notulæ I, 505.

Malacca; Griffith 1036; Maingay (Kew Dist.), No. 337. Perak: Scortechini, Wray, King's Collector. Singapore: Ridley. Penang: Curtis Nos. 662, 768, 895, 896, 2448. Distrib. Sumatra, Java.

Although resembling *A. Roxburghiana*, Miq. in its calyx and corolla, that has a different staminal tube to which the strictly included more elliptic anthers are attached near the base, whereas the anthers of



this species are shortly and broadly triangular ovoid and are inserted on the staminal tube close to its mouth. The fruits too are different.

11. *AGLAIA FORBESII*, King, n. sp. A tree 40 to 80 feet high: young branches slender and, like the angled petioles rachises and petiolules, densely and minutely rufous-tomentose. *Leaves* 12 to 15 in. long, equally pinnate; leaflets 8 to 10, membranous, alternate, rather distant, oblong to elliptic, alternate (the upper pair usually opposite) cuspidate, the base slightly cuneate; upper surface olivaceous when dry, glabrous, minutely rugulose, dull; the lower rather pale brown, minutely scurfy: main nerves 10 to 13 pairs, oblique, rather straight, faint on the upper, bold on the lower surface: length 3·5 to 5·2 in., breadth 1·5 to 2·5 in. *Panicles* axillary, solitary, densely stellate-tomentose, 4·5 to 9 in. long, the branches spreading. *Flowers* numerous, .08 in. long, ovoid, on pedicels shorter than themselves. *Calyx* sub-campanulate, densely pubescent outside, glabrous inside, with 5 deep broadly ovate lobes. *Petals* 5, twice as long as the calyx, orbicular or ovate-orbicular, concave, glabrous. *Staminal tube* shorter than the petals, turbinate-globular, the mouth with 5 broad shallow erose teeth, glabrous; *anthers* 5, ovate, included or with their apices exserted. *Ovary* small, depressed, puberulous; *stigma* large, fleshy, broadly ovoid. *Fruit* ellipsoid to ovoid, sometimes slightly gibbous at the base, or narrowly obovoid, not apiculate, pale yellow when ripe, covered with minute scurfy pubescence, 1 to 1·25 in. long, and .7 to .9 in. in diam. when dry; the pedicel short, stout.

Perak: Wray, No. 3265: King's Collector, Nos. 4762 and 10787. Pangkore: Curtis, No. 1631. Distrib. Sumatra, H. O. Forbes, No. 3179.

12. *AGLAIA SQUAMULOSA*, King, n. sp. A tree 30 to 50 feet high: young branches rather stout, the bark striate and densely covered with minute brown scurf-like pubescence. *Leaves* 15 to 30 in., unequally pinnate, petiole rachis and petiolules minutely squamulose-pubescent: leaflets 11 to 15, distant, alternate except the upper pair which are opposite, coriaceous; both surfaces minutely rugulose when dry, the upper glabrous and dull, the lower uniformly covered with shining minute pale-edged scales: main nerves 10 to 12 pairs, oblique, little curved, faint on the upper, bold on the lower surface: length 4 to 10 in., breadth 1·75 to 3·5 in., petiolules .25 to .6 in. *Panicles* axillary, solitary, much branched, spreading, squamulose, angled, many-flowered, 10 to 12 in. long. *Flowers* ovoid, .05 in. long, on pedicels shorter than themselves. *Calyx* cupular, pale-coloured, almost glabrous, divided to the base into 5 shallow broad blunt lobes. *Petals* 5, much longer than the calyx, dark-coloured, rotund, unequal, concave, glabrous. *Staminal tube* shorter than the petals, globose, the mouth

entire: *anthers* 5, ovate, large. *Ovary* rather large, pubescent, extending much beyond the base of the ovoid glabrous stigma. *Fruit* (very young) narrowly elliptic, densely scaly like the under surface of the leaflets.

Perak: King's Collector, Nos. 8805, 11013, 10145.

In its leaves this resembles *A. latifolia* Miq., but the scales on the under surface of this are much larger and more shining. The flowers too of this are much smaller and the calyx and corolla differ.

13. *AGLAIA KUNSTLERI*, King, n. sp. A tree 30 to 40 feet high; young branches rather stout and, like the petioles, rachises, petiolules and inflorescences, covered with minute deciduous, brown pubescence and scales. *Leaves* 18 to 25 in. long, unequally pinnate; leaflets 5 to 13, coriaceous, oblong-ob lanceolate to elliptic-oblong, the apices shortly acuminate, the bases usually more or less oblique, rounded or cuneate, the upper leaflets often much narrowed in the lower third: upper surface glabrous, pale green, and minutely rugulose when dry, the lower paler, rugulose, and with sparse, stellate, hairy, minute brown scales: main nerves 10 to 14 pairs, faint on the upper, and only slightly prominent on the lower surface: length 4·5 to 7·5 in., breadth 1·75 to 2·75 in. *Panicles* solitary, axillary, branching, many-flowered, 3 to 9 in. long. *Flowers* .08 in. long, globular-obovoid, on pedicels shorter than themselves. *Calyx* cupular, tapering to the pedicel, with 5 broad blunt spreading shallow lobes, minutely whitish-tomentose with bright rusty superficial stellate-hairy scales. *Petals* 5, much larger than the calyx, broadly elliptic, concave, blunt. *Staminal tube* dark-coloured, pale and scarious towards the base, shorter than the petals, globose, glabrous, 5-lobed; *anthers* 5, broadly ovate, included. *Ovary* rusty-pubescent; *stigma* thick, short, conical. *Fruit* globular, slightly depressed at base and apex, densely covered with minute pale buff-coloured hairs, about .8 in. in diam. when dry, pedicel very short.

Perak: King's Collector, Nos. 5287, 10610.

14. *AGLAIA HUMILIS*, n. sp. King. A shrub or small tree; young branches stout, rusty puberulous, the bark dark-coloured. *Leaves* 18 to 26 in. long, unequally pinnate; *leaflets* sub-opposite (the upper pair opposite), thinly coriaceous, oblong to elliptic-oblong, rarely ovate, shortly cuspidate, the base rounded or sub-cuneate; both surfaces minutely punctulate when dry, the upper glabrous except the puberulous midrib; the lower glabrous, the midrib and nerves stellate-pubescent; main nerves 11 to 20 pairs, spreading, prominent on the lower, depressed on the upper surface when dry; length 4 to 9 in., breadth 1·75 to 3·5 in.; petiolules .25 to .6 in. *Panicles* supra-axillary, solitary, 3 to 6 in. long, with few-flowered very short branches. *Flowers* globular, .05 in. in



diam. *Calyx* campanulate, pubescent-lepidote outside, the mouth with 5 large rounded teeth. *Petals* 5, longer than the calyx, elliptic, glabrous. *Staminal tube* shorter than the petals, obovoid-globose, glabrous, the mouth with 5 shallow broad blunt teeth; anthers 5, ovate-ellipsoid, included, short. *Ovary* rather broad, pubescent, with a large glabrous conical 2-lobed stigma. *Fruit* (young) globular-obovoid, 2-celled; the pericarp fleshy, cinereous-pubescent externally.

Perak: King's Collector, No. 8619; Wray, No. 3763.

15. *AGLAIA ARGENTEA*, Blume Bijdr. 170. A slender tree 10 to 15 or 20 feet high; young shoots, petioles, rachises, petiolules, inflorescences and under surfaces of the leaves densely covered with a layer of minute tomentum with many stellate hairs and flat shining white or pale-brown scales intermixed and on the surface. *Leaves* 24 to 30 in. long, unequally pinnate; leaflets 7 to 11, alternate, the odd one and the upper pairs often much the largest, thinly coriaceous, oblong-lanceolate to ovate-lanceolate or elliptic, the odd leaflet and often also the upper pair often much cuneate at the base, the lower pairs often rounded, occasionally minutely cordate and sub-sessile, the apices of all more or less acuminate: upper surface glabrous, the lower shining silvery to pale brown; main nerves 12 to 24 pairs, inconspicuous on the upper bold and prominent on the lower surface; length of the lower leaflets 5 to 9 in., of the terminal one 12 to 15 in., breadth 2 to 5 in., petiolules .2 in. *Panicles* supra-axillary, pedunculate, spreading, very dense, 3 to 5 in. long. *Flowers* crowded, numerous, sessile, sub-globular, .08 in. in diam., *Calyx* half as long as the corolla, deeply divided into 5 broad rounded imbricate concave lobes, furfuraceous-lepidote externally, glabrous internally. *Petals* 5, concave, orbicular, glabrous. *Staminal tube* globular, shorter than the petals, the mouth sub-entire; *anthers* 5, ovate, included. *Ovary* depressed; *stigma* sub-cylindric, truncate, glabrous. *Fruit* ovoid or obovoid, minutely rusty-pubescent and lepidote, .8 to 1.25 in. long, Miq. Flor. Ind. Bat. Vol. 1, Pt. 2, 543; Ann. Mus. Lugd. Bat. IV, 54; Kurz For. Flor. Burma I, 219; C. DC. Monogr. Phaner. I, 618. *A. hypoleuca*, Miq. Ind. Bat. Suppl. 507. *A. speciosa*, Teysm, and Binn. Cat. Hort. Bogor. 211 (not of Blume). *Milnea argentea*, Reinw. in Cat. Hort. Bogor. 71.

Perak: King's Collector, No. 3135. Nicobar Islands, Kurz.—Distrib. Burma, Sumatra, Java, New Guinea.

This is a widely distributed and variable species of which Miquel (Ann. Mus. Lugd. Bat. IV, 55) enumerates no less than seven varieties, most of which he had himself previously treated as species. In young shoots the leaflets are often few but very large.

Var. *eximia*, Miq. Ann. Mus. Lugd. Bat. IV, 55. *Flowers* ovoid;



petals elliptic, staminal tube ovoid; leaflets 15 to 25, oblong, opposite, sub-sessile, the bases rounded, 3 to 6 in. long, the terminal one not longer than the pairs but with a narrow base: under-surfaces from pale to cinnamoneous, not shining. *A. eximia*, Miq. Fl. Ind. Bat. Suppl. 506. *A. ancolana* Miq. l. c. 506.

Perak: King's Collector, Nos. 5767 and 10007. Distrib. Sumatra.

Var. *Curtisii*, King. *Flowers* ovoid, .15 in. long: *petals* elliptic; *staminal tube* globular, the apical aperture very small and almost entire. *Leaflets* 15 to 19, oblong, shortly acuminate and with rounded bases, the terminal one not larger than the others. *Fruit* narrowly pyriform, densely lepidote.

Penang; Curtis, No. 2287. Perak: King's Collector, No. 8239.

16. *AGLAIA LANUGINOSA*, King, n. sp. A tree 50 to 70 feet high; young branches very stout (1 in. in diam.), rugulose and rusty-tomentose between the large triangular leaf-cicatrices. *Leaves* 2 to 4 feet long, unequally pinnate everywhere, except on the upper surfaces of the leaflets, densely covered with soft rusty stellate tomentum; leaflets 9 to 13, the pairs opposite, thinly coriaceous, oblong, cuspidate, the base rounded and often minutely cordate; upper surface glabrous; main nerves 28 to 36 pairs, sub-horizontal, slightly prominent on the lower, faintly depressed on the upper surface; length 5 to 15 in., breadth 2 to 3.5 in., petiolules .25 to .4 in. *Panicles* axillary, from 9 to 12 in. long, stout; branches few, ascending and bearing short lateral spikes. *Flowers* sessile, densely crowded, depressed-globular, about .1 in. in diam. *Calyx* completely enveloping the petals, with 5 deep narrow lobes covered outside with soft stellate wool, inside glabrous. *Petals* 5, elliptic, blunt, glabrous, concave, slightly shorter than the calyx. *Staminal tube* shorter than the petals, its mouth wide and deeply 5-lobed, glabrous; *anthers* opposite its lobes, large, included. *Ovary* small; *stigma* cylindric. *Fruit* unknown.

Perak: Scortechini, No. 1682; King's Collector, Nos. 7381, 7714.

This species resembles the Bornean *A. grandis*, Miq. in its leaves, but has different flowers. *Fruit* of both species is unknown.

17. *AGLAIA CURTISII*, King, n. sp. A tree 60 to 80 feet high; young branches stout, rusty puberulous. *Leaves* 18 to 30 in. long, unequally pinnate; leaflets coriaceous, 11 to 15, sub-opposite, oblong to elliptic, shortly acuminate; the bases of the lower rounded, of the upper cuneate; upper surface glaberulous and when dry minutely pustulate, the midrib puberulous; under surface covered with dense minute rusty tomentum with numerous stellate hairs on the surface; main nerves 16 to 24, spreading, prominent beneath; length 6 to 9 in., breadth 2 to 4 in., petiolules .2 to .35 in. *Panicles* slightly supra-axillary, solitary, 6



to 8 in. long, with few sub-erect branches; the branchlets short, densely flowered, all scurfy puberulous. *Flowers* globose, sessile, more than .1 in. in diam. *Calyx* of 4 or 5 thick densely tomentose sub-rotund sepals. *Petals* 5, glabrous. *Staminal tube* short, sub-globular, with a wide mouth; *anthers* 5, short, attached close to the mouth of the tube, their apices included. *Fruit* globular-obovoid, minutely rusty puberulous, 1.5 in. long, and 1.25 in. in diam.

Pangkore: Curtis, No. 1627. Perak; King's Collector, No. 7786.

A species allied to *A. pachyphylla*, Miq., and not easy by description alone to be distinguished from that species. An examination of Miquel's type specimen of *A. pachyphylla* kindly lent to me by the authorities of the Leiden Herbarium shows that the leaves of that are distinctly falcate, while those of this are not: moreover the leaves of *A. pachyphylla* taper much more to the apex, and the panicles are more robust, than is the case in this species. The tomentum on the under surface of the leaves differs in character in the two species; and in the leaves of *A. pachyphylla* the midribs of the leaves are raised and ridge-like on the upper surface, while these of this species are depressed. The fruit of *A. pachyphylla* is unknown.

18. *AGLAIA PALEMBANICA*, Miq. Flor. Ind. Bat., Suppl. 507. A tree 10 to 25 feet high; young shoots, petioles and rachises, petiolules and inflorescence densely rusty stellate-tomentose. *Leaves* 4 to 9 in. long, unequally pinnate; *leaflets* 5 to 9, sub-opposite, membranous, oblong-lanceolate to ovate, opposite or sub-opposite, shortly acuminate, the base cuneate, the terminal and upper pairs of leaflets with bases much narrowed; upper surface sometimes deciduously lepidote, ultimately glabrous, except sometimes the pubescent lower half of the midrib; lower surface more or less closely stellate-pubescent, especially on the midrib and 6 to 11 pairs of spreading main nerves; length 1.5 to 5 in., breadth .65 to 1.75 in., petiolules .15 in. *Panicles* solitary, axillary, 1.5 to 4 in. long, slender, their branches short and divaricating, bearing the flowers in dense short spikes. *Flowers* depressed-globular, about .025 in. in diam. *Calyx* with 5 long narrow acute or sub-acute spreading unequal lobes, some of them occasionally longer than the petals, boldly stellate-tomentose outside, glabrous inside. *Petals* 5, obovate-elliptic, concave, glabrous. *Staminal tube* shorter than the petals, glabrous, its mouth truncate entire; *anthers* 5, ovate, curved, half-exserted. *Ovary* large, pubescent, stigma 3-angled. *Fruit* ellipsoid (narrowly so when young), deciduously stellate-tomentose, .75 in. long, and .6 in. in diam. Miq. Ann. Mus. Lugd. Bat. IV., 52; Hiern in Hook. fil. Fl. Br. Ind. I, 557; C. DC. Monogr. Phaner. I, 619. *Aglaia Sipannas*, Miq. Fl. Ind. Bat. Suppl. 508. *A. tomentosa*, Teysm. and Binn. in Nat. Tijdschr. Ned.

Ind. Vol. 27. p. 43. *A. rufa*, Miq. in Ann. Mus. Lugd. Bat. IV, 649. C. DC. Monogr. Phaner. I, 613.

Malacca: Griffith, No. 1043. Maingay (Kew Distrib.), No. 333. Penang: Curtis, No. 2003; King's Collector, No. 1790. Perak: Scortechini, Wray, King's Collector. Kedah: Curtis, No. 2520. DISTRIBUTION: Sumatra, Bangka, Borneo.

This differs from its nearest ally *A. Griffithii* in its large, irregularly lobed, very tomentose calyx, and in its smaller fruit and leaves. I have examined authentic specimens of *A. Sipannas*, Miq. and of *A. rufa*, Miq., and I cannot see how they are to be separated from *A. palembanica*, Miq. A specimen in the Leiden Herbarium, collected by Korthals in Sumatra, and named in Miquel's handwriting *A. elliptica*, Blume, var. *Sumatra*, ought in my opinion to be referred to this species. The plant named by Teysmann and Binnindyk *A. tomentosa*, and of which Curtis's specimen from Kedah, No. 2520, is an example, has longer leaflets than typical *A. palembanica*, with more nerves, and more tomentose beneath; but I think its reduction to this is justifiable. This plant has a wider distribution than is usual with species of this family, and slight local differences are thus naturally to be expected.

19. *AGLAIA CORDATA*, Hiern in Hook. fil. Fl. Br. Ind. I, 557 (excl. var. 2). A tree 20 to 30 feet high; young shoots, petioles, rachises, petiolules and inflorescence more or less densely clothed with rusty or tawny stellate-tomentum. *Leaves* 7 to 15 in. long, unequally pinnate; leaflets 7 to 9, the pairs opposite, rarely sub-opposite, membranous, oblong-ob lanceolate, rarely ovate or elliptic, all with shortly acuminate apices, the odd one the largest and much attenuate towards the base, the paired leaflets cuneate, minutely cordate at the very base; upper surface glabrous, the midrib slightly pubescent; the lower stellate-pubescent, sometimes densely so, the midrib always, and the nerves usually, tomentose; main nerves 10 to 14 pairs, oblique, slightly depressed on the upper surface when dry and prominent on the lower: length 4 to 6 in., breadth 1.75 to 2.25 in., petiolules less than .1 in. or absent; the terminal leaflet larger and with a petiolule .2 to .4 in. long. *Panicles* axillary, solitary, 3 to 6 in. long, the branches spreading, the ultimate branchlets shorter, spike-like, and densely crowded with flowers. *Flowers* about .35 in. in diam., sub-sessile, otherwise as in those of *A. palembanica*. *Fruit* globular or ovoid, densely covered with deciduous rusty stellate tomentum, .5 to .65 in. in diam. C. DC. in Monogr. Phaner. I, 618 (excl. var. b. *calyce glabro*).

Malacca: Maingay (Kew Distrib.), Nos. 334, 335/2. Singapore: Ridley, No. 333. Perak: Scortechini; Wray, No. 2962; King's Collector, Nos. 2836, 3646, 5071, 6360.



Under his species *A. cordata*, Mr. Hiern has in my opinion included two plants. The species *A. cordata*, as here limited, includes only Hiern's form with hirsute calyx, and is really little more than a large-leaved variety of *A. palembanica*. Mr. Hiern's form with glabrous calyx is, in my opinion, a distinct species, the calyx differing not only in being glabrous, but in being much smaller, and of quite a different shape. I have described it as a species under the name *A. Hiernii*.

20. *AGLAIA HIERNII*, King, n. sp. A tree 40 to 80 feet high; young branches, petioles, rachises, petiolules and inflorescences, densely clothed with rather soft rusty stellate tomentum. *Leaves* 14 to 18 in. long, unequally pinnate; leaflets 7 to 9, the pairs opposite, thickly membranous, oblong or oblong-lanceolate; the terminal one oblong-oblancoate, longer than the others and two or three times as long as the petiolule; the apices of all shortly and sharply acuminate, the bases cuneate, especially of the uppermost ones; upper surface glabrescent with a few scattered stellate-hairs, the midrib and nerves densely stellate-pubescent; under-surface uniformly covered with pale-brown-centred scales and a superficial layer of rufous stellate tomentum; main nerves 13 to 22 pairs, sub-horizontal, depressed on the upper and bold on the lower surface when dry; length 4 to 6 in. (the odd one an inch longer); breadth 1.75 to 2.25 in., petiolules of the pairs .15 in. *Panicles* slightly supra-axillary, solitary, 8 to 12 in. long, the branches divaricating, the ultimate branchlets bearing densely-flowered spikes. *Flowers* .4 in. long, sessile, globular. *Calyx* cupular, quite glabrous, with 4 or 5 deep broad rounded imbricate lobes. *Petals* 5, rotund or ovate-rotund, unequal, much longer than the calyx, the outer 3 the largest, all concave and glabrous. *Staminal tube* shorter than the petals, cup-shaped, the mouth wide; the 5 ovate *anthers* inserted by very short filaments on the edge of the tube, but inflexed so as to be included. *Ovary* small, pubescent; *stigma* depressed-spheroidal, pubescent. *Fruit* unknown.

Malacca: Maingay. Perak: King's Collector, Nos. 5976, 6706, 10877.

This is allied to *A. cordata*, Hiern, but differs from it in having leaflets with more numerous and more horizontal main nerves, more densely tomentose and lepidote beneath. The calyx of this, moreover, is conspicuously different, being smaller, having broad lobes much shorter than the petals, and quite glabrous, while the calyx of *A. cordata*, as limited here, has a large calyx densely stellate-tomentose externally, and with acute lobes often longer than the petals. This is a large tree, often attaining a height of 80 feet, while *A. cordata* is a small tree from 20 to 30 feet high.

21. *AGLAIA GRIFFITHII*, Kurz in Journ. As. Soc. Bengal, for 1875, p. 146. A tree 30 to 50 feet high; young branches petioles, rachises, petiolules and inflorescences densely clothed with minute rusty stellate pubescence. *Leaves* 12 to 18 in. long, unequally pinnate; leaflets 13 to 19, opposite or sub-opposite, narrowly elliptic or oblong-lanceolate, often slightly oblanceolate, shortly acuminate, the base rounded or sub-cuneate: upper surface glabrous except the rusty tomentose midrib, the nerves inconspicuous; lower surface sparsely stellate-pubescent, the midrib and 10 to 12 pairs of bold curved spreading nerves tomentose; length 2·5 to 5 or even 6 in., breadth 1 to 1·4 in., petiolules about ·15 in. *Panicles* solitary, axillary, spreading, many-branched, many-flowered. *Flowers* about ·025 in. in diam., depressed-globular, broader than long. *Calyx* cupular with 5 deep broad lobes, pubescent outside. *Petals* 5, twice as long as the calyx, concave, glabrous. *Staminal tube* shorter than the petals, glabrous; *anthers* 5, ovate, partly exserted. *Ovary* pubescent; *stigma* depressed-hemispheric. *Fruit* pyriform, densely covered with sub-deciduous rusty scurfy stellate tomentum, 1·75 in long, and 1·25 in. in diam. Kurz For. Flora Burma I, 219. *A. minutiflora* Bedd. var. *Griffithii*, Hiern in Hook. fil. Fl. Br. Ind. I, 557: C. DC. in Phaner. Monogr. I, 616.

Malacca: Griffith, Nos. 1039 and 1040: Maingay, No. 334-2 (No. 334 is *A. cordata*, Hiern). Perak: Scortechini, Wray, King's Collector, Nos. 4231, 6282, 6341, 6346, 10285, 10925, 10957.

The flowers of this are less than half the size of those of *A. minutiflora* Bedd.—a plant of Western Peninsular India, of which Mr. Hiern and M. C. De Candolle make this a variety. On dissecting male flowers of an authentic specimen of Beddome's plant I find, however, that not only are the flowers larger, but they are of a different shape, being globular-obovoid, while those of this plant are depressed-globular and broader than long. The calyx of this, moreover, is about half as long as the petals, while the calyx of Beddome's plant is not more than a third or a fourth of the length of its petals. Moreover, the leaflets of *A. minutiflora* Bedd., are less numerous than in this plant, and the tomentum on their lower surface is much more dense. The fruit hitherto described as belonging to this plant, is that issued from Kew as No. 334 of Maingay's Herbarium. That fruit, however, does not belong to this species, but to *A. cordata*, Maing. It is globular and, in size as well as in shape, greatly resembles that of *A. minutiflora*. The true fruit of this (now described for the first time) is pyriform and much larger than that of *A. minutiflora*. On account of these differences, I therefore follow Kurz in regarding this as a distinct species from the latter.

22. *AGLAIA MEMBRANIFOLIA*, King, n. sp. A tree 20 to 60 feet high.



*Leaves* 2 to 3 feet long, the petioles, rachises and petiolules covered with minute harsh tomentum, unequally pinnate; leaflets from 7 to 11, thinly membranous, elliptic-oblong, acuminate, the base cuneate; upper surface glabrous, pale greenish when dry, the lower surface darker and sometimes with a tinge of purple, very sparsely and minutely stellate-pubescent, the midrib boldly so; main nerves 20 to 30 pairs, faint on the upper, bold on the lower surface; length 9 to 15 in., breadth 2·75 to 5·5 in., petiolules only about ·1 in. *Panicles* everywhere stellately rusty-pubescent, slightly supra-axillary, with numerous, many-flowered, spreading branches. *Flowers* about ·035 in. in diam., depressed-globular, almost sessile, often with a few bracteoles at the base. *Calyx* rotate, with 5 deep broad rounded membranous pubescent lobes. *Petals* 5, broadly ovate to rotund, longer than the calyx, glabrous, concave. *Staminal tube* shorter than the petals, cupular, sub-entire, glabrous; *anthers* 5, ovate, curved, exserted. *Ovary* small, much depressed; *stigma* depressed-spheroidal, vertically grooved. *Fruit* ovoid or ovoid-globose, tapering at the base into a short pseudo-stalk, densely covered with minute scaly tawny tomentum, 1 in. long, and ·75 in. in diam.

Perak: King's Collector, Nos. 5901 and 7104. DISTRIBUTION: Sumatra; Forbes, No. 1679.

This resembles *A. tenuicaulis*, Hiern; but it has smaller flowers, different calyx and staminal tube and larger fruit. The texture of the leaflets is also thinner and the stellate hairs on their under surface less numerous.

23. *AGLAIA TENUICAULIS*, Hiern in Hook. fl. Fl. Br. Ind. I, 556. A shrub or small tree 10 or 12 feet high with a slender stem 2 to 3 in. in diam. *Leaves* 3 feet or more in length, unequally pinnate; the long petiole, rachises, petiolules and young branches densely stellate rusty-tomentose; leaflets membranous, oblong to elliptic, minutely cuspidate to shortly acuminate; the base cuneate, rarely rounded; upper surface glabrous, the lower sparsely minutely stellately rufous-pubescent; main nerves 15 to 20 pairs, spreading, obsolete on the upper prominent on the lower surface; length 6 to 12 in., breadth 2·5 to 4·5 in.; petiolules ·3 to ·35 in., stout. *Panicles* slightly supra-axillary, everywhere densely rufous-pubescent like the petioles, about 12 in. long, with spreading densely-flowered branches, those bearing fruit only a few inches long. *Flowers* ·05 in. long, globular, on pedicels longer than themselves. *Calyx* cupular, stellate-pubescent outside, glabrous inside, with 5 deep acute spreading teeth. *Petals* 5, much longer than the calyx, ovate or sub-obovate, concave, elliptic, glabrous. *Staminal tube* shorter than the petals, globular, inflated about the middle of the sub-entire mouth, glabrous except at the base inside; *anthers* 5, short, ovate, included. *Ovary*

small, stellate-hairy. *Stigma* elliptic, obtuse. *Fruit* obovoid, rugulose, densely covered with minute rusty stellate-tomentum, about .4 in. long, C. DC. in Monogr. Phaner. I, 615.

Penang: Maingay (Kew Distrib.), No. 3252. Curtis, No. 747. Selangor; Ridley. Perak; Wray, King's Collector, Scortechini. Singapore; Lobb. DISTRIB. Sumatra.

24. *AGLAIA TRICHOSTEMON*, C. DC. Monogr. Phaner. I, 608. A tree 30 to 60 feet high; young shoots, petioles and rachises of leaves and inflorescences deciduously rusty stellate-tomentose, scabroid beneath the tomentum. *Leaves* 18 to 27 in. long, unequally pinnate; leaflets 9 to 13, alternate or opposite, sub-coriaceous, oblong to elliptic, shortly acuminate, the base slightly cuneate or rounded; upper surface glabrous, the lower sparsely and minutely stellately pubescent; main nerves 12 to 16 pairs, slightly depressed on the upper surface when dry, bold on the lower; length 4 to 8 in.; breadth 2 to 2.75 in.; petiolules .25 to .4 in. *Panicles* supra-axillary, solitary, nearly as long as the leaves, with few divaricating lax branches, densely and minutely rusty stellulate-pubescent and scaly. *Flowers* obovoid, globose, .06 in. long, on pubescent pedicels shorter than themselves. *Calyx* shallow, cupular, deeply divided into 5 rotund, blunt, spreading lobes, pubescent externally. *Petals* 5, slightly unequal, ovate-rotund, concave, glabrous, much longer than the calyx. *Staminal tube* shorter than the petals, thin, puberulous, obovate, the mouth with 5 broad emarginate shallow teeth; *anthers* 5, broadly ovate, small, inserted near the edge of the tube, included. *Disc* rather large, inferior to the ovary, pubescent. *Ovary* small, cylindric, 4-angled, glabrous. *Fruit* globular to ovoid, shortly pedicelled, densely covered with minute rusty stellate tomentum, .4 to .6 in. long. *Cupania rufescens*, Wall. Cat. 8067 B (exclude A). *Aglaia edulis*, Hiern in Hook. fil. Fl. Br. Ind. I, 1556. *Aglaia cupanioidea*, King MSS.

Penang; Wallich. Perak; Scortechini, King's Collector, Nos. 5597, 5901. Pahang; Ridley, No. 5885. Singapore, Anderson, No. 29; Ridley, No. 5833. Malacca; Derry, Nos. 1076, 1186. DISTRIBUTION Borneo, Beccari, No. 3981.

Although first collected so long ago as Wallich's time, fruit of this very distinct species is now described for the first time. It resembles *A. tenuicaulis* and *A. membranifolia* to some extent in its leaves, but is a much larger tree than either, and its leaflets have a thicker texture. Its fruits are much smaller than those of *A. membranifolia*; and, although of about the same size as those of *A. tenuicaulis*, they are covered with much shorter tomentum. Specimens of this were distributed from the Calcutta Herbarium under the MSS. name *Aglaia cupanioidea*, King MSS.



25. *AGLAIA MACROSTIGMA*, King, n. sp. A tree 40 to 60 feet high; young branches very stout, lenticellate, puberulous. *Leaves* 2·5 to 4 feet long, unequally pinnate, the petioles very long, ·3 in. thick, and, like the rachises petiolules and inflorescence, covered with minute brown scales; leaflets 15 to 17, the pairs opposite or nearly so, membranous, elliptic to elliptic-oblong, slightly oblique, shortly and sharply acuminate, the base rounded; upper surface everywhere glabrous, the lower glabrous, the midrib and nerves rugulose and minutely scaly: main nerves 12 to 20 pairs, depressed on the upper surface, very prominent on the lower; length 5 to 10 in., breadth 2 to 4 in., petiolules ·5 to ·7 in. *Panicles* axillary, solitary, about 12 in. long (including the long peduncle), the branches rather short, many-flowered. *Flowers* broadly obovoid, about ·08 in. long, on short stout rusty-tomentose pedicels. *Calyx* half as long as the corolla, cup-shaped, the mouth with 4 unequal broad valvate teeth, rusty-stellate-tomentose externally. *Petals* 5, glabrous, imbricate, the two external longer and orbicular, the 3 inner smaller and elliptic. *Staminal tube* shorter than the petals, cupular, the mouth wide and with 8 to 10 lanceolate teeth; *anthers* 7 or 8, large, elliptic, much exserted. *Ovary* depressed, 3 angled, 3-celled, yellowish-pubescent, crowned by a glabrous erect fleshy deeply-fluted 3-angled stigma. *Fruit* elliptic-obovoid, narrowed to a short pseudo-stalk, covered with minute pale scales, 1·5 in. long, and 1 in. in diam.

Perak: King's Collector, Nos. 6531, 6919, 7559.

Like *A. heteroclita*, King, this species has more than 5 stamens, and it has a larger stigma than is usually found in *Aglaia*. Its inflorescence is quite that of *Aglaia*, as also is its fruit.

26. *AGLAIA HETEROCLITA*, King, n. sp. A tree 30 to 40 feet high, glabrous except the inflorescence and under surfaces of the leaves. *Leaves* 18 to 30 in. long, equally or unequally pinnate: leaflets thinly coriaceous, 8 or 9 to 10 or 11, distant, alternate, oblong to elliptic-oblong, oblique, more or less acuminate, the base cuneate and oblique: both surfaces dull and pale when dry (especially the lower), the upper glabrous, the lower with sparse minute rusty stellate scales; main nerves 12 to 16 pairs, spreading, faint on the upper, and only slightly conspicuous on the lower surface; length 4 to 7 in., breadth 1·5 to 2·75 in.; petiolules ·35 to ·75 in., slender. *Panicles* axillary or terminal, 2·5 to 6 in. long, stout, the branches not divaricating, the ultimate branchlets minutely bracteolate, densely flowered. *Flowers* ·125 in. long, sub-globular, on thick pedicels shorter than themselves and with a spongy epidermis. *Calyx* fleshy, corrugated, conspicuously pellucid-dotted, deeply divided into 5 broad rounded imbricated concave lobes. *Petals* 5, somewhat longer than the calyx and thinner, not dotted, ellip-

tic, blunt, concave especially towards the apex. *Staminal tube* shorter than the petals and darker in colour, globular-cylindric, the mouth obscurely lobed. *Anthers* 7 or 8, elliptic, included. *Ovary* pyramidal, fleshy, grooved, pubescent, 2-celled, crowned by the glabrous, broadly and shortly cylindric, grooved, indistinctly 2-lobed stigma. *Ovules* 2 in each cell, superposed. *Fruit* obovoid or pyriform, shortly apiculate, minutely scaly-tomentose, about 1 in. long including the pseudo-stalk, and .8 in. in diam., apparently indehiscent, 1- or 2-seeded.

Perak; King's Collector, No. 10896, Wray (at elevation of 3400 ft.), Nos. 1135, 3994. **DISTRIB.** Sumatra, Forbes, Nos. 1558 and 1696.

This differs from typical *Aglaia* in having 7 or 8 stamens, and its stigma is that of *Amoora* rather than of *Aglaia*. The inflorescence resembles that of *Aglaia argentea*, Bl.

27. *AGLAIA ANDAMANICA*, Hiern in Hook. fil. Fl. Br. Ind. I, 218. A tree 30 to 40 feet high; young branches, petioles, midribs, inflorescence and calyx covered with pale-brownish deciduous scales. *Leaves* 12 to 15 in. long, unequally pinnate; leaflets 5 to 7, alternate, membranous, ovate-elliptic to elliptic, shortly and obtusely acuminate, the base rounded or sub-cuneate, slightly oblique; main nerves 13 to 15 pairs, faint; upper surface glabrous, shining; the lower dull, sparsely scaly; main nerves 13 to 16 pairs, oblique, slightly prominent below; length 4 to 6 in., breadth 2 to 3 in., petiolule .25 to .35 in. *Panicles* crowded towards the ends of the branches, axillary, solitary, 2 to 3 in. long, many-flowered. *Flowers* broadly ovoid, truncate, .15 in. long, on pedicels shorter than themselves. *Calyx* cupular, puberulous and scaly outside, the mouth with 5 pointed minute erect teeth. *Petals* 5, larger than the calyx, elliptic, slightly obovate, the apex blunt and incurved, puberulous externally, the edges membranous and glabrous. *Staminal tube* ovoid-globose, the apex sub-truncate, with 4 obscure broad teeth; *anthers* 8 or 9, narrowly elliptic, sessile, inserted at the base of the tube, included. *Ovary* small, depressed, 3-angled, densely tawny-tomentose; *stigma* sub-capitate, glabrous, fleshy, 2-3-angled. *Fruit* narrowly ellipsoid, lepidote, 1.5 in. long. Kurz For. Flora Burma. I, 218. C. DC. Monogr. Phaner. I, 606. *Amoora dysoxyloides*, Kurz Journ. As. Soc. Bengal II, 1875, p. 200; I, 222. C. DC. l. c. I, 589.

The Andaman and Nicobar Islands; Kurz, King's Collectors. **DISTRIB.** Great Coco Island, Prain. Burma, Brandis.

Kurz described his *Amoora dysoxyloides* on scanty specimens collected by Sir Dietrich Brandis in Burma. I have carefully dissected flowers from these and I find they are those of an *Aglaia*, and belong to *A. andamanica*, Hiern.

28. *AGLAIA MAINGAYI*, King, n. sp. A shrub? young branches, thin,



with pale bark and minute brown scales. *Leaves* 4 to 6 in. long; *leaflets* 4 or 5, alternate or opposite, membranous, oblong-elliptic, shortly and bluntly acuminate, the base cuneate, both surfaces glabrous; main nerves 6 to 9 pairs, ascending, faint; length 2·5 to 3·5 in.; breadth 1·15 to 1·5 in., petiolule ·25 in. *Panicles* one or two from an axil, shorter than the leaves, slender, much branched, scaly. *Flowers* on pedicels as long as themselves, depressed-globular, ·15 in. in diam. *Calyx* widely cupular, pubescent and scaly outside, with 4 or 5 broad shallow erect unequal teeth. *Petals* 4 or 5, larger than the calyx, obovate, the upper half concave, glabrous or puberulous, attached by their bases to the staminal tube. *Staminal tube* depressed-globose, the mouth wide and obscurely toothed, puberulous below the anthers inside; *anthers* 10, half as long as the tube, ovate, included. *Ovary* minute, depressed, pubescent, 3-celled, 3-ovuled; *stigma* short, cylindric, glabrous. *Fruit* (young) broadly obovoid, deeply 3-grooved, puberulous, 3-celled, with a single seed in each cell. *Aglaia Maingayi*, Hiern in Hook. fil. Fl. Br. Ind. I, 562. C. DC. Monogr. Phaner. I, 588.

Malacca: Maingay (Kew Distrib.), No. 342 (Herb. prop. No. 1910).  
Perak: King's Collector, No. 3325, Scortechini.

#### *Doubtful Species.*

A tree has been collected in Perak both by Mr. Wray and Mr. Kunstler (Collector of the Calcutta Botanic Garden), which I believe to be *Aglaia Korthalsii*, Miq. The Perak specimens are in fruit only; and it is only by comparison with Miquel's type specimen of *A. Korthalsii* in the Leiden Herbarium (which is in flower only), that I have made the identification. The species closely resembles *A. macrostigma*, King, but has shorter leaves with more slender rachises and petiolules: the fruit is also larger and more obovoid. I have distributed the Perak plant as doubtfully *A. Korthalsii*, but not having flowers, I do not describe it here.

#### 8. LANSIUM, Rumph.

Trees with unequally pinnate leaves; the leaflets quite entire, alternate or opposite, shortly petiolulate. *Flowers* polygamo-dioecious, 5-merous, axillary, the male usually paniculate, the female spicate-racemose. *Sepals* rounded, imbricated. *Petals* rounded, connivent, concave, imbricated. *Staminal tube* globose, the mouth entire or crenulated; *anthers* 10, obtuse, usually in two rows, the shorter ones included, the longer partly exserted, sometimes apiculate. *Disk* obsolete. *Ovary* globose, 3-5-celled; cells 1-2-ovuled; *style* very short, thick; *stigma* truncate, 3-5-lobed. *Fruit* baccate, edible, 1-5-celled, cells

1-2-seeded; *seeds* oblong, invested in a pulpy aril, exalbuminous.—

DISTRIB. Four species, all Indo-Malayan.

Leaflets 5 to 10 in. long; main nerves about

10 pairs ... 1. *L. domesticum*.

Leaflets 2 to 3 in. long: main nerves very

numerous ... 2. *L. cinereum*.

Doubtful species ... 3. *L. pedicellatum*.

1. *LANSIUM DOMESTICUM*, Jack in Trans. Linn. Soc. XIV, 115, t. IV. f. 1. A tree 30 to 50 feet high; young branches with pale glabrous lenticellate bark. *Leaves* 12 to 18 in. long; leaflets 5 to 7, alternate, coriaceous, oblong-elliptic, sometimes slightly obovate, abruptly shortly and obtusely acuminate, narrowed and slightly unequal at the base; both surfaces shining, reticulate, glabrous or slightly puberulous toward the base; main nerves about 10 pairs, ascending, curved, depressed on the upper, prominent on the lower surface when dry; length 5 to 10 in., breadth 2.75 to 4 in., petiolules .5 in.; the terminal 1 in., jointed. *Hermaphrodite spikes* from the trunk and larger branches, solitary or in fascicles, pubescent, much shorter than the leaves. *Flowers* sessile or on very short pubescent pedicels, solitary, minutely bracteolate at the base. *Calyx* fleshy, puberulous, with 5 shallow rounded teeth. *Petals* longer than the calyx, sub-rotund, glabrous. *Staminal tube* sub-globose, the mouth sub-entire, truncate, shorter than the petals, the stamens in a single row. *Ovary* sub-globular, tomentose, 5-celled; *style* short, thick, 10-furrowed; *stigma* large, discoid. *Berry* oblong-ovate to obovoid, sub-tomentose, 1 to 1.5 in. long; *seeds* usually about 2, embedded in much transparent pulp. Correa de Serra in Ann. Mus. X, 157, t. 7, fig. 1; Blume Bijdr. 165; A. Juss. Mem. Mel. 81; Miq. Fl. Ind. Bat. Vol. I, Pt. 2, 545; Hiern in Hook. fil. Fl. Br. Ind. I, 558; C. De Cand. Monogr. Phaner. I, 598.

Malacca: Griffith, Maingay (Kew Distrib.), No. 338. Perak: Wray, King's Collector, common. Cultivated in all the Provinces, except the Andamans and Nicobars, on account of its edible fruit. DISTRIB. The Malayan Archipelago.

There are several varieties of this which have been by some authors regarded as species, *e.g.*, *L. aqueum*, Jack, *L. humile*, Hassk.

2. *LANSIUM CINEREUM*, Hiern in Hook. fil. Fl. Br. Ind. I, 558. A tree; young branches tawny-pubescent at first, afterwards cinereous. *Leaves* 3 to 5 in. long, unequally pinnate; leaflets 3 to 5, opposite, sub-coriaceous, elliptic-oblong, obtusely cuspidate, the base acute; both surfaces quite glabrous, pale when dry; main nerves very numerous, obscure; length 2 to 3 in., breadth .8 to 1.5 in., petiolules .1 to .25 in. *Spikes* nearly as long as the leaves, glabrous. *Flowers* hermaphrodite.



*Calyx* cupular, puberulous, with 5 obscure rounded teeth. *Petals* obovate, glabrous. *Anthers* oblong, mucronate. *Ovary* globose, pubescent, 5-celled, longer than the glabrous style. *Fruit* unknown. C. DC. Monogr. Phaner. I, 598.

Malacca: Maingay (Kew Distrib.), No. 339.

Known only by Maingay's scanty specimens.

3. *LANSIUM PEDICELLATUM*, Hiern in Hook. fil. Fl. Br. Ind. I, 558. A tree; young branches pale brown, scaly. *Leaves* 9 to 12 in. long, unequally pinnate; leaflets 3 to 5, alternate or sub-opposite, thinly coriaceous, elliptic, shortly and sharply acuminate; the base oblique, obtuse or cuneate; both surfaces glabrous; main nerves 8 to 10 pairs, ascending, spreading, slightly prominent beneath; length 3 to 6 in., breadth 1·5 to 2·5 in., petiolules ·15 to ·25 in. *Male flowers and inflorescence* unknown. *Racemes of female flowers* 1 to 2 in. long, axillary, sometimes with a branch at the base; flowers on pedicels ·1 to ·15 in. long. *Ovary* minutely tomentose, 4-celled; *stigma* sessile. *Young fruit* sub-globose, fleshy, shortly tomentose.

Malacca: Maingay (Kew Distrib.), No. 356.

The above description is drawn up from the only two specimens which I have seen, and from Hiern's and De Candolle's descriptions. There is nothing in it to connect the species absolutely with *Lansium*, the genus in which its author has placed it.

## 9. *WALSURA*, Roxb.

Trees. *Leaves* 1-9-foliolate; leaflets opposite, entire, pale beneath. *Panicles* axillary and terminal; *Flowers* small, hermaphrodite. *Calyx* short, 5-fid or -partite, the lobes spreading, imbricated in bud. *Petals* 5, ovate-oblong, spreading, slightly imbricated or sub-valvate. *Filaments* 10 or 8, linear or flattened, free or connate in a tube; *anthers* terminal or inserted in the notch at the apex of the filament. *Disk* usually annular, fleshy. *Ovary* short, 2-3-celled, imbedded in the disk, style rather short; *stigma* turbinate-capitate, 2-3-dentate; *Ovules* 2 in each cell. *Fruit* baccate, shortly tomentose, indehiscent, 1- rarely 2-celled and -seeded; *seed* inclosed in a fleshy aril, exalbuminous. **DISTRIB.** about 12 species, Indo-Malayan.

Filaments united near the base.

Leaflets 5 to 9, with 5 or 6 pairs of main  
lateral nerves ... ..

Leaflets not more than 5, with 8 to 10  
pairs of main lateral nerves.

Stigma discoid, fruit not apiculate 2. *W. neurodes*.

1. *W. multijuga*.

Stigma conical, with a large swollen  
annulus round its base; fruit  
apiculate ... 3. *W. Candollei*.

Filaments quite free.

Leaflets five, 5 to 7 in. long, glaucous  
beneath, flowers .15 in. long ... 4. *W. hypoleuca*.

Leaflets three to five, 3 to 5 in. long,  
not glaucous; flowers .25 in. long ... 5. *W. robusta*.

1. *WALSURA MULTIJUGA*, King n. sp. A tree 20 to 30 feet high: young branches cinereous, puberulous, not lenticellate. *Leaves* 5 to 9 in. long, rachis puberulous; leaflets 5 to 9, coriaceous, lanceolate or oblong-lanceolate, shortly acuminate, usually much narrowed but sometimes rounded and oblique at the base; both surfaces glabrous, the lower paler; main nerves 5 or 6 pairs, ascending, curved, slightly prominent on the lower surface: length 2.5 to 5 in., breadth .75 to 1.5 in., rarely 2 in., petiolules .15 to .2 in., the terminal .4 or .5 in. *Panicles* small, umbellate-cymose, pedunculate, much shorter than the leaves, clustered in the axils of the leaves or terminal, puberulous; the peduncles 1 to 2 in. long, the heads about 1 in. in diam. *Flowers* about .1 in. long, their pedicels shorter. *Calyx-teeth* short, broad, spreading. *Petals* 5, broadly elliptic, blunt, puberulous outside, longer than the calyx. *Stamens* 10, shorter than the petals; the filaments slightly united into a tube in the lower third, the upper two-thirds free, flattened, bifid at the apex, glabrous outside, pubescent inside below the anthers. *Anthers* small, ovate, inserted between the divaricating incurved teeth of the filaments. *Disc* proper, none. *Ovary* broadly obovoid or ovoid-globular, tapering into the very short style, glabrous; *stigma* small, capitate with a central mammilla. *Fruit* ovoid or ovoid-globose, apiculate, densely rusty-tomentose, .5 in. long without the apiculus. *Melospermum rubro-stamineum*, Scort. MS. in Herb. Calc.

Perak: Scortechini, Wray, King's Collector, very common. **DIST.** Sumatra, Upper Burma.

2. *WALSURA NEURODES*, Hiern in Hook. fil. Fl. Br. Ind. I, 564. A tree; young branches cinereous-puberulous. *Leaves* 6 to 8 in. long; leaflets 5, narrowly elliptic or elliptic-oblong, shortly and bluntly acuminate, the base cuneate or rounded; upper surface glabrous, shining, the lower glaucous; main nerves 8 to 10 pairs, spreading, rather prominent beneath; length 2 to 4 in., breadth 1 to 2 in., petiolule .25 to .35 in., the terminal one 1 in. *Panicles* equal to or longer than the leaves, on rather long peduncles, their lateral branches lax, short, the flowers near their apices and not numerous. *Flowers* .15 in. long, pedicels shorter. *Calyx* with 5 short broad ovate spreading teeth. *Petals*



5, broadly elliptic, blunt, glabrescent inside, puberulous outside. *Stamens* 10, shorter than the petals; the filaments flattened, pubescent, faintly united in their lower third but easily separable, inserted outside the annular entire glabrous disc. *Ovary* pubescent, surrounded by the disc, ovoid-conic, tapering into the thick glabrous style; *stigma* discoid, small. *Fruit* ovoid or ovoid-rotund, minutely puberulous, not apiculate, about .65 in. long. C. DC. Monogr. Phaner. I, 636.

Malacca: Maingay (Kew Distrib.), Nos. 344 and 345. Griffith, No. 1057 (Kew Distrib.). Perak: Wray, No. 3798.

3. *WALSURA CANDOLLEI*, King, n. sp. A small tree; young branches glabrous, lenticellate, dark-coloured when dry. *Leaves* 4 to 7 in. long, unequally pinnate; leaflets usually 5, membranous, lanceolate, sub-acute, the base rounded; both surfaces glabrous, the lower pale, sub-glaucous; main nerves 7 to 11 pairs, spreading, curving; length 2 to 4 in., breadth .75 to 1.2 in., petiolules .2 to .4 in. *Panicles* puberulous, crowded towards the ends of the branches, axillary, on slender pedicels 2 to 3 in. long, corymbosely cymose, about 1.5 in. across. *Flowers* .1 in. long, sub-globular, on pedicels about as long as themselves. *Calyx* of 5, free ovate concave spreading sepals, pubescent externally. *Petals* 5, much larger than the sepals, elliptic-ovate, sub-acute, puberulous. *Stamens* 10, the filaments united into a tube in their lower third, pubescent, the alternate shorter, all inserted outside the thick glabrous annular disc. *Anthems* attached to the apices of the filaments, broadly ovate, short, sparsely pubescent. *Ovary* pubescent, conical, surrounded by the disc. *Style* short, ob-conical; *stigma* conical, surrounded at the base by a projecting fleshy annulus. *Fruit* ovoid-globose, with a slightly curved conical apiculus, densely but minutely rusty-puberulous, .75 in. long.

Andaman Islands; Kurz, King's Collector.

This species is allied to *W. neurodes*, Hiern, from which it differs in its more hairy petals and stamens, thicker style, more conical stigma and apiculate fruit. I dedicate the species to M. Casimir De Candolle, who first detected it as new from fragmentary specimens sent to him by the late Mr. Kurz. M. De Candolle did not include it in his Monograph of *Meliaceæ* (Monogr. Phaner. Vol. I), but kindly communicated the fact of his discovery to me. Specimens since sent to me by the collectors of the Calcutta garden confirm the accuracy of his decision.

4. *WALSURA HYPOLEUCA*, Kurz Rep. Veg. Andam. ed. 2, p. 33. A tree 40 to 50 feet high; young branches stout, puberulous, lenticellate. *Leaves* 12 to 14 in. long, glabrous; leaflets 5, thinly coriaceous, elliptic-oblong, sub-acute, the base cuneate; upper surface shining, the lower glaucous; main nerves 7 or 8 pairs, ascending, prominent beneath;

length 5 to 7 in., breadth 2 to 3 in., the terminal one a third larger and with more nerves; petiolules  $\cdot 75$  in., that of the terminal leaflet 2 in. *Panicles* several from an axil, 4 to 6 in. long, pubescent, the branchlets short and slender with the flowers crowded near their apices. *Flowers*  $\cdot 15$  in. long, on short puberulous pedicels. *Calyx-teeth* 5 or 6, elongate, ovate or lanceolate, puberulous. *Petals* 5, longer than the calyx, elliptic-obtuse, erect, puberulous. *Stamens* 10, distinct, inserted outside the disc, shorter than the petals; the filaments flattened, but not quite so broad as the ovate anthers, sparsely villous. *Disc* annular, cushion-like, entire, glabrous, surrounding the ovoid-conic, villous, ovary. *Style* cylindric, thickened upwards, glabrous; *stigma* discoid. Unripe fruit (*fide* Kurz) "oblong, acuminate, greyish-velvety." Kurz in Journ. As. Soc. Bengal, Vol. 41, Pt. 2, p. 296; For. Flora Burma I, 224; Hiern in Hook. fil. Fl. Br. Ind. I, 564. C. D. Cand. Monogr. Phaner. I, 639.

Andaman Islands: at Port Mowat.

This has been collected only by Kurz and I have never seen its fruit. I believe Kurz's species *C. oxycarpa* is merely a small-leaved form of this. Kurz distinguishes it from this by its thinner leaves and fainter venation,—characters of little value, I fear.

5. *WALSURA ROBUSTA*, Roxb. Hort. Beng. 32: Fl. Ind. II, 386. A tree 40 to 60 feet high; young branches slender, lenticellate, glabrous. *Leaves* 7 to 12 in. long. *Leaflets* 3 to 5, sub-coriaceous, ovate-oblong to ovate, entire, bluntly acuminate, the base narrowed; both surfaces glabrous, the upper shining, the lower dull with the 6 or 7 pairs of curving nerves rather prominent; length 3 to 5 in., breadth  $1\cdot 75$  to  $2\cdot 25$  in.; petiolules about  $\cdot 5$  in., that of the terminal leaflet  $1\cdot 5$  in. *Panicles* dense, many-flowered, shorter than the leaves, cinereous-puberulous; bracts (if any) deciduous. *Flower-buds* hemispheric, tomentose, subsessile. *Petals*  $\cdot 2$  in. long (larger than the sepals). *Stamens* 10; the filaments flattened, lanceolate, puberulous, free from each other, inserted outside the broad, thin, sub-concave, pubescent disk. *Ovary* depressed-globose, crowned by the thick style, 2-celled, with 2 ovules in each cell; *stigma* discoid with a central mammilla. *Fruit* elliptic or globular,  $\cdot 75$  in. in diam., when dry capsular, 2-celled, but one of the cells empty. *Seed* pendulous, testa membranous, albumen 0; the cotyledons fleshy, plano-convex; the radicle short, superior. Hiern in Hook. fil. Fl. Br. Ind. I, 565: Kurz For. Fl. Burm. I, 223; C. De. Cand. Monogr. Phaner. I, 638; Wall. Cat. 1266, 8110, 8111, 8112. *Surwala robusta*, Roem. Synops. i. 108. *Monocyclis robusta*, Wall. ex Voigt Hort. Suburb. Calcutta 135. *Scytalia glabra*, Hb. Ham. ex Wall. Cat. 8048 E, (not the other letters.)



Andaman Islands: very common. **DISTRIB.** Brit. India, in Burma, Silhet, Assam, Sikhim.

#### 10. HEYNEA, Roxb.

Trees or rarely shrubs. *Leaves* 5-11-foliolate; leaflets opposite, entire. *Panicles* terminal and axillary, corymbose, long-peduncled; *Flowers* rather small, hermaphrodite. *Calyx* short, 4-5-fid, the lobes imbricate. *Petals* 4-5, oblong, suberect, sub-imbricate. *Staminal tube* 8- or 10-fid; lobes linear, bidentate at apex, bearing the anthers between the linear teeth. *Disk* annular, fleshy. *Ovary* immersed in the disk, 2-3-celled, narrowing into the short style; *stigma* 2-3-dentate, with a thickened ring at the base; *ovules* 2 in each cell. *Fruit* capsular, 1-celled, 2-valved, 1-seeded, glabrous. *Seed* arillate, exalbuminous; aril thin, white; cotyledons hemispherical.—**DISTRIB.** 1-3 species, limited to Indo-Malaya.

HEYNEA TRIJUGA, Roxb., Hort. Beng. 33. A small tree 15 to 20 feet high. *Leaves* 6 to 16 in. long; leaflets broadly ovate to ovate-lanceolate, shortly acuminate, the base rounded or cuneate; upper surface glabrous, the lower surface glaucous, glabrous or pubescent; the 6 to 8 pairs of curving spreading nerves slightly prominent; length 2·5 to 5·5 in., breadth ·8 to 2·75 in., petiolule ·15 to ·45 in., the terminal ones longer. *Panicles* glabrous as long or nearly as long as the leaves, on long peduncles, with numerous corymbose branches. *Flowers* ·15 in. long. *Petals* much longer than the calyx, their midribs thick, their edges membranous. *Staminal tube* wide. *Ovary* glabrous. *Fruit* ovoid, beaked; the pericarp somewhat fleshy, smooth, splitting by 2 rarely 3 valves. Roxb. in Bot. Mag. t. 1738; Corom. Plants III, 260; Flor. Ind. II, 390; Grah. Cat. Bomb. Pl. 31; Adr. Juss. in Mem. Mus. xix. t. 18, f. 17; Dalz. & Gibs. Bomb. Fl. 38; Wall. Cat. 1258; Brandis For. Fl. 70. DC. Prod. I, 624; Monogr. Phaner. I, 713; Hiern in Hook. fil. Fl. Br. Ind. I, 565. *H. affinis*, Adr. Juss. l.c. 275; Beddome Fl. Sylvat. t. 134; W. & A. Prodr. i. 121. *Walsura (Heynea) pubescens*, Kurz in Journ. Asiat. Soc. Beng. xli. ii. 297. *Walsura trijuga* Kurz For. Fl. Burm. I, 225. *H. connaroides*, Wight ex Voigt Hort. Suburb. Calcutta 136.

Perak: common, and probably also in the other provinces.—**DISTRIB.** British India, Sumatra.

Var. *multijuga*. DC. Monogr. Phaner. I, 714. Leaflets 11, lanceolate. *H. quinquejuga*, Roxb. Hort. Calc. 90; Fl. Ind. II, 391. Wall. Cat. 1259. *H. Sumatrana*, Miq. Ann. Mus. Lugd. Bat. IV, 60; DC. Monogr. Phaner. I, 714.

Penang: Wallich, No. 1259. Curtis, No. 676.

## 11. CARAPA, Aubl.

Glabrous littoral trees. *Leaves* 2- or 4- or sometimes 6-foliolate; leaflets opposite, quite entire, the nerves faint. *Panicles* lax, axillary, cymose, flowers hermaphrodite. *Calyx* 4-fid, short. *Petals* 4, reflexed. *Staminal tube* urceolate-globose, 8-dentate, the teeth bi-partite: *anthers* 8, 2-celled, included, alternating with the teeth. *Disk* fleshy, cup-shaped, adherent to the base of the ovary. *Ovary* 4-celled, 4-sulcate, the *cells* 2-8-ovuled; *style* short, *stigma* discoid. *Fruit* capsular, sub-globose, large, 4-celled, 6-12-seeded; pericarp fleshy, dehiscing by 4 valves. *Seeds* large, thick, angular; testa hard, spongy, aril 0, hilum large, ventral; cotyledons amygdaloid.—DISTRIB. About 6 species, all tropical and usually littoral.

*Leaves* with broad blunt apex and narrow base, coriaceous; panicles stout; fruit as large as an orange ... 1. *C. obovata*.

*Leaves* with sub-acute apex and broad base, very thinly coriaceous; panicles slender: fruit 7 to 10 in. in diam. ... 2. *C. moluccensis*.

1. CARAPA OBOVATA, Blume Bijdr. 179. *Leaves* 3 to 6 in. long; leaflets 1 to 2 pairs, coriaceous, obovate to oblong, the apex broad, obtuse, rarely notched or sub-acute, the base narrowed; main nerves 6 to 9 pairs, length 3 to 4 in., breadth 1.35 to 1.75 in., petiolules .2 to .35 in. *Panicles* 1.5 to 2.5 in. long, stout, cymose, few-flowered. *Flowers* .25 in. long, their pedicels .3 to .5 in. long, bracteolate. *Calyx-teeth* broad, rounded. *Petals* much longer than the calyx, broadly elliptic, the edges imbricate. *Ovary* broadly ovoid. *Fruit* the size of an orange, apiculate when young, but not when ripe. C. DC. Monogr. Phaner. I, 718: Seemann Flora Vitiensis p. 28. *C. moluccensis*, Kurz (not of Lamk. For. Flor. Br. Burma, I, 226: *C. moluccensis*, (in part,) Hiern in Hook. fil. Fl. Br. Ind. I. 567. *Xylocarpus obovatus*, A. Juss. Mem. Mel. p. 92; Miq. Fl. Ind. Bat. I, Pt. 2, p. 546.

Malacca: Maingay, (Kew Distrib.) No. 347; Griffith, No. 1098. Perak; Scortechini, King's Collector. South Andaman; Kurz, King's Collectors. Little Andaman: Prain. DISTRIB. Sunderbuns of Bengal: (Heinig) and others; Java and other islands of the Malayan Archipelago. Tropical Africa.

2. CARAPA MOLUCCENSIS, Lamk. Encyc. Meth I, 621. *Leaves* 4 to 10 in. long; leaflets usually 2 pairs, thinly coriaceous, almost membranous, broadly ovate to ovate-oblong, sub-acute, the base broad, unequal; main nerves about 6 pairs, spreading; length 2 to 4 in., breadth 1.5 to 2.35 in., petiolules .15 to .25 in. *Panicles* 3 to 5 in. long, slender, with lax spreading few-flowered branches. *Flowers* as in the last, but



with rather broader petals and a shorter style. *Fruit* sub-globular, 7 to 10 in. in diam. Blume Bijdragen, 179; C. DC. Monogr. Phaner. I, 719; Don. Gen. Syst. I, 686; DC. Prod. I, 626; Bedd. Flor. Sylvat. t. 136; Seeman Flor. Viti, 38; Hiern in Hook. fil. Fl. Br. Ind., (*in part*,) I. 567. *C. indica*, A. Juss. Dict. Sc. Nat. VII., p. 31. *Xylocarpus granatum*, Willd. Spec. III, 328; A. Juss. Mem. Mel. p. 92, t. 20, No. 22; Roxb. Fl. Ind. II, 240; Wight and Arn. Prod. 121; Blanco Flor. Philipp. ed. 2, p. 207; A. Gray U. S. Exped. I, 243. *X. granatum*, Koenig, Miq. Fl. Ind. Bat. I, Pt. 2, p. 546; *X. Forstenii* Miq. Ann. Mus. Lugd. Bat. IV, 62.

South Andaman Island; Kurz, King's Collectors. Great Coco Island; Prain. DISTRIB. Burma, Malayan Archipelago, S. India, Fiji Islands, Africa.

## 12. CHICKRASSIA, Adr. Juss.

A tree with pari-pinnate leaves, alternate sub-opposite or opposite oblique entire leaflets, terminal panicles and 4-5-merous flowers. *Calyx* short, dentate. *Petals* oblong, free, imbricate, erect. *Staminal tube* cylindric; its mouth with 10 short blunt teeth. *Anthems* 10, short, attached to the edge of the mouth and entirely exserted. *Disk* none. *Ovary* cylindric, on a short stalk, 3-celled; the ovules numerous, in 2 rows in each cell; *style* very short, stout; *stigma* capitate. *Capsule* woody, 3-celled, loculicidal; the pericarp separating into two layers. *Seeds* numerous, flat, winged below, exalbuminous. A single species.

CHICKRASSIA TABULARIS, A. Juss. in Mém. Mus. XIX, 251, t. 22, f. 27. A tall tree; young branches stout, lenticellate, sub-glabrous. *Leaves* 12 to 18 in. long; leaflets 10 to 16, ovate to oblong, unequal-sided, acute or acuminate; the base rounded on one side, narrowed on the other: upper surface glabrous, the lower glabrous or more or less velvety; length 2 to 5 in., breadth 1 to 2.5 in., petiolules .15 to .35 in. *Panicles* terminal, erect, shorter than the leaves; the branches spreading, pubescent, many-flowered. *Flowers* .4 to .5 in. long. *Calyx* with 5 short, shallow, broad teeth, pubescent outside. *Petals* puberulous outside, pubescent inside. *Capsule* ovoid, 1.75 in. long; seeds .65 in. long. W. and A. Prod. 123; Thwaites Enum. 61; Wight Ill. t. 56; Bedd. Fl. Sylvat. t. 9; Grah. Cat. Bomb. Pl. 32; Kurz For. Flora Burm. I, 227; Hiern in Hook. fil. Fl. Br. Ind. I, 568; C. DC. Monogr. Phaner. I, 726. *Swietenia Chickrassia*, Roxb. Hort. Beng. 33; Fl. Ind. II, 399. *Plageotaxis Chickrassia*, Wall. Cat. 1269. *S. Sotrophola*, Ham. ex Wall. Cat. p. 214. *Chickrassia triloculuris* Roem. Syn. I, 135; Roxb. ex Buch. Journ. I, 184; G. Don. Gen. Syst. I, 688. *Cedrelae* sp. Wall. Cat. 4892.

Var. *velutina*, leaflets, more or less velvety beneath. *C. velutina*

Roemer Synops. fasc. I, p. 135; Kurz For. Flora Burma I, 227; C. DC. Monogr. Phaner. I, 717. *C. Nimmonii* Grah. in Wight Ill. 148; Dalz. and Gibs. Fl. Bombay, 38. *Plageotaxis velutina*, Wall. Cat. 1270. *Cedrela velutina*. DC. Prod. I, 625. ? *Cedrela villosa*, Roxb. Hort. Beng. 18. ? *Melia tomentosa*, Kurz Rep. Veg. Andam. ed. i. p. iv., (not of Roxburgh). ? *Toona velutina*, Roem. Synops. Monogr., i. 139. ? *T. villosa*. Roem, l. c. 140.

Malacca: Maingay. Andaman Islands: King's Collectors. DISTRIB. Burma, British India, Ceylon.

### 13. CEDRELA, Linn.

Tall trees with coloured wood. *Leaves* pinnate; leaflets numerous, opposite or sub-opposite, entire or serrate. *Panicles* terminal and sub-terminal. *Flowers* white, pentamerous. *Calyx* short, 5-cleft. *Petals* sub-erect, oval, imbricated, free. *Stamens* 5, free, inserted at the top of the disk, rarely alternating with staminodes, filaments subulate. *Anthers* oblong, versatile. *Disk* thick or raised, 5-lobed. *Ovary* sessile on the top of the disk, 5-celled; *cells* alternate with the calyx-lobes, each with 8-12 bi-seriate pendulous ovules; *style* filiform; *stigma* discoid. *Capsule* coriaceous, 5-celled, septifragally 5-valved, *valves* consisting of two plates. *Seeds* compressed, winged at the apex or at both ends, with fleshy albumen; *cotyledons* flat, sub-foliaceous.—DISTRIB. About 16 species, inhabiting Tropical Asia, Australia, and America.

CEDRELA FEBRIFUGA, Forsten Diss. Cedrel. 16. A tree 80 to 150 feet high; young branches puberulous, lenticellate. *Leaves* 15 to 24 in. long, glabrous; leaflets membranous, 7 to 10 pairs, obliquely ovate-oblong, shortly and bluntly acuminate, the base broad and unequal-sided, the edges entire; main nerves 12 to 15 pairs, sub-horizontal, distinct beneath when dry; length 3.5 to 4.25 in., breadth 1.75 to 2 in., petiole .2 in. *Panicles* terminal, shorter than, or as long as the leaves, spreading, glabrous; their ultimate branches short, cymose, crowded. *Flowers* .2 in. in diam., on short pedicels. Segments of the calyx spreading, much shorter than the petals, obtuse, pubescent at the edges. *Petals* broad, obtuse, pubescent. *Stamens* 6, slightly shorter than the petals, the filaments and ovary sericeous. *Capsule* 1 in. long, lenticellate. *Seeds* winged at each end, .6 to .7 in. long. Blume Bijdr. I, 180; A. Juss. Mem. Mel. 103; Miq. Flor. Ind. Bat. V. I, pt. 2, 548; Suppl. 197; Ann. Mus. Lugd. Bat. IV, 63; De Cand. Monogr. Phaner. I, 744. *C. Toona*, Hiern (not of Roxb.) Hook. Fl. Br. Ind. I, 569. *Toona febrifuga*, Roem. Syn. fasc. I, 139.

Penang: Curtis, No. 826. Perak: King's Collector, No. 10403.

In the Flora of British India, Mr. Hiern has reduced this to  
J. II. 12



*C. Toona*, Roxb. And there is no doubt that the flowers of the two are very similar, differing chiefly in the hairiness of the petals and stamens of *C. febrifuga*. The panicles, however, of *C. febrifuga* are longer and their ultimate branches are shorter and denser than those of *C. Toona*. The capsules, moreover, are much longer (1 in. as against .6 in.). The flowers of all the species of *Cedrela* are very much alike. I hesitate therefore, to follow Mr. Hiern merely because very good distinctive characters cannot be had from the flowers, and I prefer to follow De Candolle in maintaining this as a species. The nearest ally of *C. febrifuga* is undoubtedly *C. microcarpa* C. DC.

#### Order XXVIII. CHAILLETIACEÆ.

Trees or shrubs. *Leaves* alternate, quite entire; *stipules* 2, deciduous. *Flowers* small, unisexual or polygamous, in corymbose cymes; *peduncles* sometimes adnate to the petiole. *Sepals* 5, free or connate, sometimes unequal, imbricate. *Petals* 5, free, sub-perigynous, equal or unequal, notched or 2-fid, with often an inflexed lamina which is adnate to the face of the petal, usually open in æstivation. *Stamens* 5, sub-perigynous, all or some only fertile, free or adnate to the corolla; *Anthers* oblong, connective often thickened at the back. *Disk* of 5 glands or scales, or a 5-glandular or -lobed cup. *Ovary* free, pubescent or villous, 2-3-celled; *styles* 1-2-3, free or more or less connate; *stigmas* simple or capitate; *ovules* anatropous, pendulous in pairs from the top of each cell. *Drupe* pubescent or hispid, oblong, transversely oblong or didymous, compressed; *epicarp* entire or dehiscent; *endocarp* indehiscent or not, 1-3-celled; *cells* 1-seeded. *Seed* pendulous, hilum broad, testa membranous, albumen 0; *embryo* large; *cotyledons* thick, radicle small, superior.—A small chiefly tropical order, of 3 genera and about 40 species.

##### I. CHAILLETIA, DC.

Flowers polygamo-monœcious. *Sepals* 5, unequal, united at the base or above it, obtuse. *Petals* 5, 2-lobed, narrow, free. *Stamens* 5, sometimes slightly adnate at the base to the petals. *Disk* of 5 quadrate scales placed opposite the petals. *Ovary* 2-3-celled.—DISTRIB. Tropical Asia, Africa, and especially America; species about 30.

Leaves oblong or elliptic, lanceolate.

Leaves very thin, quite glabrous; cymes

globular, .25 in. to .4 in. in diam. ... 1. *C. tenuifolia*.

Leaves coriaceous, glabrous except the

midrib, strigose at the base; cymes 1 to

2 in. in diam. ... 2. *C. Hookeri*.



- Leaves membranous, with many fulvous  
bristles on the edges midribs and nerves 3. *C. Griffithii.*
- Leaves elliptic or oblong-elliptic  
Midribs of leaves strigose beneath; cymes  
·5 in. in diam.; ripe drupes ·65 in. broad 4. *C. Helferiana.*
- Midribs of leaves quite glabrous; cymes  
·3 in. in diam.; ripe drupes 1·25 in. in  
diam. ... 5. *C. Laurocerasus.*
- Leaves elliptic but more or less ob-lanceo-  
late or obovate, glabrous ... 6. *C. andamanica.*
- Leaves elliptic-obovate, retuse, minutely tomen-  
tose on the lower surface ... 7. *C. deflexifolia*  
var. *tomentosa.*

1. CHAILLETIA TENUIFOLIA, King, n. sp. A shrub, 6 feet high; young branches, angular, puberulous. *Leaves* thinly membranous, elliptic-lanceolate, tapering to either end, the apex shortly acuminate: both surfaces glabrous and reticulate; main nerves 5 to 8 pairs, ascending, curving and interarching boldly, depressed on the upper, prominent on the lower surface; length 6 to 8 in., breadth 2·25 to 2·75 in.; petiole ·15 in., strigose. *Cymes* small, globular, ·25 to ·4 in. in diam., axillary, solitary; their pedicels ·15 in., strigose. *Flowers* sub-globular, ·05 in. in diam. *Sepals* erect, elliptic, obtuse, minutely sericeous outside, glabrous inside. *Petals* shorter but broader than the sepals, glabrous, slightly bifid at the apex, the lobes sub-acute. *Stamens* shorter than the petals, the filaments slightly sericeous, shorter than the oblong innate anthers, connective slightly sericeous. *Ovary* ovoid, densely sericeous-lanate; *style* short. *Ripe fruit* deeply 3-lobed ·6 in. long and ·75 in. broad.

Perak: King's Collector, No. 3498.

This species shows no tendency to become scandent.

2. CHAILLETIA HOOKERI, King, n. sp. A climber; young branches terete, puberulous at first, afterwards glabrous. *Leaves* coriaceous, oblong-lanceolate and acuminate (rarely oblong and obtuse or sub-acute), the base narrowed, reticulate and shining on both surfaces, glabrous except a few strigose hairs on the midrib near the base; main nerves 8 to 10 pairs, curving and interarching far from the edge; length 4·5 to 6·5 in., breadth 1·5 to 2 in.; petiole ·25 in., strigose. *Cymes* axillary, usually in pairs, pedunculate, tomentose, dichotomous, spreading, 1 to 2 in. in diam., the peduncles ·5 to ·75 in. long. *Flowers* about ·1 in. long. *Sepals* oblong, blunt, erect, concave, sericeous-tomentose outside, glabrous inside. *Petals* glabrous, shorter but broader than the sepals, deeply divided into two concave irregularly obovate overlapping



segments. *Stamens* about as long as the petals, glabrous; *anthers* adnate, blunt, broad, the cells on the edges of the connective. *Ovary* ovoid, densely lanate-sericeous; *style* elongate, thin. *Ripe drupe* unknown. Wall. Cat. No. 7443.

Penang: Porter. Perak: Scortechini.

This is the species referred to by Sir Joseph Hooker (Fl. Br. Ind. I, 572), as probably an undescribed species of *Chailletia*. The species, when Sir Joseph wrote, was known only by Porter's incomplete specimens. A few specimens of what is evidently the same plant were collected by the late Father Scortechini in Perak, and these have enabled me to describe the flowers. The fruit, however, still remains unknown.

3. *CHAILLETIA GRIFFITHII*, Hook. fil. Fl. Br. Ind. I, 571. A slender climber; young branches striate, dark-coloured when dry, clothed with numerous long, spreading, stiff, fulvous hairs with minute soft, short, white pubescence between. *Leaves* membranous, oblong-lanceolate, acuminate, the base rounded or minutely cordate; upper surface glabrous except the sparsely bristly midrib, the lower with numerous bristles on the midrib and a few scattered elsewhere chiefly on the nerves, the edges ciliate; main nerves 9 to 11 pairs, ascending, rather bold beneath; length 4 to 7 in., breadth 1 to 2 in., petiole .1 in., densely bristly. *Cymes* globular, axillary, sessile, densely bristly, .4 to .5 in. in diam. *Flowers* campanulate, nearly .25 in. across at the mouth. *Sepals* sub-erect, narrowly ovate, densely sericeous on the outer, and slightly pubescent on the inner surface. *Petals* glabrous, not longer than the sepals but broader, obovate, the apex shortly bifid, the lobes sub-acute, concave. *Stamens* as long as the petals, the anthers short, broadly ovate, the cells anterior. *Ovary* ovate, densely lanate-sericeous; *style* shorter than the stamens; *stigmas* 3, small, truncate. *Ripe fruit* (*fide* Hooker) 1.5 in. long, 2-celled. *C. lanuginosa*, Maing. MSS.

Perak; King's Collector, No. 6117. Malacca; Griffith, No. 2169 (Kew Distrib.), Maingay, No. 370.

Griffith describes this as "a shrub." It is actually a climbing shrub 15 to 20 feet long. The flowers are white.

4. *CHAILLETIA HELFERIANA*, Kurz in Journ. As. Soc. Bengal, XLI, (1872), Pt. 2, 297. Scandent; young branches adpressed-yellowish pubescent, terete. *Leaves* thinly coriaceous, elliptic or oblong-elliptic, shortly and abruptly acuminate, the base cuneate, both surfaces reticulate (the lower rather obscurely so) and glabrous, the midrib strigose beneath; main nerves 7 or 8 pairs, spreading, faint; length 4 to 6 in., breadth 1.25 to 2.25 in.; petiole .25 in., strigose. *Cymes* solitary, axillary, about .5 in. in diam.; their pedicels about .3 in. long, strigose.

*Flowers* sub-globular, less than .1 in. long. *Sepals* broadly ovate, blunt, sericeous on the outer, pubescent on the inner surface. *Petals* smaller than the sepals, elliptic, obtuse, shortly bifid, the lobes blunt. *Filaments* very short, the anthers ovate, the cells anterior. *Ovary* conical, laxly sericeous. *Ripe drupe* transversely oblong, compressed, .65 in. broad, and only .4 in. long, minutely tomentose. Hook. fil. Fl. Br. Ind. I, 570.

Langkani; Curtis, No. 1687.—DISTRIB. Burma, Wall. Cat. 4038. Tenasserim; Helfer (Kew Distrib.), No. 2172.

Curtis's Langkani specimens are in fruit only, and those of Helfer's Tenasserim collecting (the type of the species) are in flower only. But the two seem identical. I have not seen the Wallichian sheet No. 4038.

5. *CHAILLETIA LAUROCERASUS*, Planch. ex Hook. fil. Fl. Br. Ind. I, 572. A scandent glabrous shrub 30 to 40 feet long; young branches slender, dark-coloured. *Leaves* coriaceous, elliptic or elliptic-oblong, obtusely acuminate, the base narrowed, upper surface shining when dry, the lower paler; main nerves 7 or 8 pairs, spreading, faint; length 3.5 to 4.5 in., breadth 1.5 to 2.5 in., petiole about .1 in. *Cymes* axillary, globose, few-flowered, .3 in. in diam., shortly pedunculate. *Flowers* .15 to .2 in. in diam. *Sepals* hoary outside, glabrous inside, broadly ovate or orbicular, concave. *Petals* longer than the sepals, glabrous, oblong, cut half way down into two oblong blunt concave slightly divergent segments. *Filaments* nearly as long as the petals; *anthers* shortly ovate. *Ovary* densely lanate-sericeous, broadly ovoid; *style* stout, *stigma* concave. *Drupe*s transversely oblong or globose, 1.25 in. in diam. when ripe, the epicarp hoary; *endocarp* thick, tubercled outside, 1- or 2-seeded. Wall. Cat. 7513, (*indeterminatæ*).

Penang; common. Perak: King's Collector.

6. *CHAILLETIA ANDAMANICA*, King n. sp. A small tree; young branches pale-brown, lenticellate, puberulous. *Leaves* thinly coriaceous, elliptic-oblongate or elliptic-obovate, abruptly and shortly blunt-acuminate, much narrowed at the base; both surfaces glabrous, minutely reticulate, pale when dry; main nerves 4 to 6 pairs, much curved and interarching far from the edge, only slightly prominent on either surface; length 3 to 4.75 in., breadth 1.25 to 2.5 in., petiole .15 to .2 in. *Stipules* lanceolate, about as long as the petiole. *Flowers* in dense axillary shortly pedunculate dichotomous cymes. *Buds* ovoid-globular. *Sepals* 5, sub-rotund, very concave, hoary externally, much imbricate. *Petals* 5, quadrate, not bifid, glabrous, shorter than the sepals. *Stamens* shorter than the petals, the filaments very short, anthers ovate. *Rudimentary ovary* ovoid, compressed, hairy. *Female flowers* not seen. *Fruit* about .5 in. broad, and .4 in. depth, transversely oblong, much compressed, puberulous, divided into two lobes by a deep vertical groove,



2-celled, 2-seeded, (often from the abortion of one of the cells) ovoid, 1-celled and 1-seeded.

South Andaman Island; King's Collectors.

The greatest breadth of the leaves in this species is above the middle, and in this respect it differs from *C. gelonoides*. The point of the leaves is also shorter than in that species; the flowers are less hairy, the cymes less crowded, and they are pedunculate and not sessile as in *C. gelonoides*.

7. *CHAILLETIA DEFLEXIFOLIA*, Turcz. in Bull. Mosc. 1863, pt. 1, 611, var. *tomentosa*. A climber, 10 to 30 feet long; young branches densely and minutely olivaceous-tomentose. *Leaves* thinly coriaceous, elliptic-obovate, retuse; upper surface minutely reticulate when dry, glabrous when adult except the minutely tomentose midrib and nerves; lower surface softly and minutely pilose, the midrib tomentose as are the 5 to 7 pairs of curved, spreading, main nerves; length 4·5 to 6·5 in., breadth 2·5 to 3·25 in., petiole ·3 to ·4 in. *Cymes* axillary, and often terminal, pedunculate, tomentose, dichotomous, spreading, often 3 in. in diam.; the peduncles 1 to 1·25 in. long, stout. *Flowers* ·25 in. in diam. *Sepals* oblong-lanceolate, deflexed, sericeous-tomentose outside, glabrous inside. *Petals* as long as the sepals, deeply divided into 2 lanceolate segments. *Stamens* as long as the petals, the anthers shortly ovate. *Ovary* densely lanate-sericeous, depressed globular, the style slender, stigma small. *Drupe*s compressed, rotund-reniform, sericeous, rugose, pitted, 1 in. broad; the endocarp very hard, 2-celled, 2-seeded. Hook. fil. Fl. Br. Ind. I, 571; Wall. Cat. 9016 (*indeterminatæ*).

Malacca; Griffith, Maingay. Perak; King's Collector, Wray, Scortechini.

#### Order XXIX. OLACINÆ.

Trees or shrubs, rarely herbs, sometimes climbing. *Leaves* alternate, rarely opposite, simple or lobed, penni- or palmi-nerved, exstipulate. *Inflorescence* cymose or racemose, rarely capitate, terminal, axillary or extra-axillary, sessile or more or less peduncled. *Flowers* regular, hermaphrodite, polygamo-dioecious or dioecious. *Calyx* usually small, 4–5-toothed, sometimes accrescent, free or adherent to the fruit, lobes valvate or imbricate. *Petals* 3–6, valvate or imbricate, free, or more or less coherent. *Stamens* 3–15, inserted with the petals, free or adnate to them and either opposite to or alternate with them, all fertile, or some (staminodes) anantherous, disunited or more or less monadelphous. *Anthers* erect, 2-celled, dehiscing longitudinally. *Disc* hypogynous or perigynous, cup-shaped, often absent. *Ovary* free, or half inferior, 1-celled or imperfectly 2–3–5-celled (from the dissepiments not



reaching the apex of the cavity). *Style* simple or 0, rarely divided; *stigma* 1 rarely 2, entire or lobed; *ovules* 1–5, pendulous from the apex of a minute free central placenta, or from the side or apex of the ovarian cavity; *funicle* (or placenta?) often dilated into a thickened process above the ovule. *Fruit* drupaceous or dry, indehiscent, 1- rarely 2-celled, 1- rarely 2-seeded, free, or more or less adnate to the calyx-tube and disk. *Seed* pendulous; albumen fleshy, entire or lobed, rarely 0; *radicle* superior; *cotyledons* leafy, flat or folded, rarely fleshy.—DISTRIB. Genera about 45, species about 220, widely distributed through the Tropics of both hemispheres.

The *Olacineæ* are rather an assemblage of plants than a Natural Order. The solitary character which is common to all the species included under the title is pendulous ovulation; and even that character is obscured by the fact that, in a number of the genera, the ovules are pendulous from the apex of a minute free central placenta which does not grow as the pistil develops, so that the seeds are erect in the fruit and have the appearance of originating from a basal placenta. In the remaining genera, both ovules and seeds are unmistakably pendulous from the apex, or from near the apex, of the cavities of the ovary and fruit. The majority of the genera have hypogynous stamens and superior fruit. But in *Erythrophalum* the stamens are perigynous and the fruit is inferior; while *Cansjera* and *Lepionurus* have their stamens perigynous in the flower, but the fruit (from the development of the fertilized pistil in a downward direction) is most distinctly inferior. In by far the greater majority of the species the stamens are free from each other, or, at the most, are slightly coherent by their bases: but in *Harmandia* the sessile anthers are attached near the mouth of a fleshy staminal tube like that found in *Meliaceæ*; and this tube, in an anantherous condition, is found in the pistillate flowers. By far the greater number of the genera have both calyx and corolla; but in *Cansjera* and *Lepionurus* the perianth is single, and in *Phytocrene* and *Miquelia* the organs which take the place of the outer whorl of the flower appear to be rather bracts than a true calyx. In most of the genera the petals are really free from each other; for, although many of them cohere by their edges for a time, they ultimately become separate; while in a smaller number there is genuine cohesion near their bases. In *Harmandia* however the corolla is gamopetalous and urceolate at all times and its texture is fleshy.

All the genera treated of below are woody except *Cardiopteris* which is herbaceous, and which moreover has milky juice. And all the genera have alternate leaves except *Ctenolophon* in which the leaves are opposite. The whole order appears to me to be in want of revision: and the study of the species described below leads me to incline to the opinion that several of the sub-tribes would be better treated as distinct natural orders; while one (*Opilieæ*) might be transferred to *Santalaceæ*.

#### FRUIT DRUPACEOUS: STIGMA 1.

*Ovules pendulous from the apex of a minute axile placenta; seed spuriously erect.*

Dichlamydeous, ♂: fruit superior.

Sub-Tribe I.—*Olacææ*. Stamens aniso-



merous, twice as many as or equal to and opposite the petals: ovary 2- to 5-celled at the base, 1-celled at the apex, or simply 1-celled.

Fruit superior.

Calyx much enlarged in the fruit.

Fertile stamens 3 to 5, not in a tube ... 1. *Olax*.

Stamens 4, the filaments forming a fleshy tube ... 2. *Harmandia*.

Calyx not enlarged in the fruit.

Fertile stamens 12 to 15 ... 3. *Ochanostachys*.

Fertile stamens 5 ... 4. *Bracea*.

Fruit inferior ... 5. *Strombosia*.

Monochlamydeous, ♂ ; fruit inferior.

Sub-Tribe II.—*Opilieæ*. Stamens equal in number to the segments of the perianth and opposite to them; ovary 1-celled, 1-ovuled.

Scandent ... 6. *Cansjera*.

Shrubby ... 7. *Lepionurus*.

*Ovules and seeds pendulous from the apex of the ovary and fruit.*

\* Stamens hypogynous.

Sub-Tribe III.—*Ximeniæ*. Stamens as many as or twice as many as the petals; ovary 2- to 4-celled at the base, 1-celled at the apex.

Leaves opposite ... 8. *Ctenolophon*.

Leaves alternate.

Fertile stamens 10.

Stamens hypogynous, free from the petals ... 9. *Ximenia*.

Stamens attached by pairs to the petals ... 10. *Scorodocarpus*.

Fertile stamens 6, concealed in the concavities of the petals ... 11. *Anacolosa*.

Sub-Tribe IV.—*Icacineæ*. Flowers dichlamydeous, ♂, or polygamo-dioecious: stamens equal in number to the petals and alternate with them; ovary 1- rarely 2-celled, ovules 2 (rarely 1). Shrubs or trees.

Ovary and fruit 1-celled.

Flowers polygamo-dioecious;  
ovary in female flowers cylindric,  
with large sessile discoid stigma.

Sepals 5, distinct, imbricate;  
male flowers in short axillary  
interrupted glomerulose  
spikes ... .. 12. *Platea*.

Calyx cupular, 4 5-toothed,  
flowers in cymes ... 13. *Gomphandra*.

Flowers hermaphrodite, stigma  
minute ... .. 14. *Lasianthera*.

Ovary and fruit 2-celled, the cells  
1-ovulate (1 cell aborting) ... 15. *Gonocaryum*.

Sub-Tribe V.—*Phytocreneæ*. Flowers  
monoecious or dioecious, mono-ordi-  
chlamydeous, 4- or 5-merous (the pieces  
imbricate): stamens equal in number  
to and alternate with the segments  
of the perianth in the monochla-  
mydeous, and with those of the corol-  
la in the dichlamydeous species: ovary  
1-celled, ovules 2. Scandent shrubs.

Flowers monochlamydeous.

Flowers 4-merous, those of both  
sexes in capitules, bracteoles  
close to the flower; drupe  
bristly ... .. 16. *Phytocrene*.

Flowers 5-merous, the males  
umbellate, the females capi-  
tate, bracteoles separated  
from the flower by a long  
stalk; drupe not bristly ... 17. *Miquelia*.

Flowers dichlamydeous.

Flowers sessile in long pendulous  
interrupted spikes; filaments  
longer than the anthers:  
drupe pulpy ... .. 18. *Sarcostigma*.

Flowers in cymose panicles;  
filaments shorter than the  
anthers; drupe with very  
little, if any, pulp ... 19. *Iodes*.

\*\* Stamens perigynous.



Sub-Tribe VI.—*Erythropaleæ*. Flowers dichlamydeous, ♂. Petals 5, perigynous, the stamens as many as and inserted opposite to them. Ovary half-immersed in the perigynous disk, 1-celled, with 1 to 3 ovules. Fruit inferior, crowned by the persistent calyxlobes and by the disc, pericarp splitting vertically into 3 to 5 pieces.

Scandent tendril-bearing shrubs ... 20. *Erythropalum*.

FRUIT SAMAROID; STIGMAS 2.

Sub-Tribe VII.—*Cardiopterideæ*. Flowers dichlamydeous, ♂ : corolla gamopetalous, the stamens equal to and alternate with its segments; ovules pendulous; stigmas 2, one at least of them persistent at the apex of the samaroid fruit.

Trees; ovary 2-celled, with 1 ovule in each cell, fruit 2-celled ... 21. *Pteleocarpa*.

Herbs; ovary 1-celled, ovules 2 (1 usually abortive), fruit 1-celled, juice milky ... 22. *Cardiopteris*.

#### 1. OLAX, Linn.

Trees or shrubs, often scandent, sometimes armed. *Leaves* alternate, petioled, simple. *Racemes* axillary, simple, or branched. *Bracts* minute. *Calyx* minute, cup-shaped, truncate or obscurely toothed, accrescent. *Petals* 4 or 5, hypogynous, valvate, free or more or less coherent. *Fertile stamens* usually 3, generally opposite the edges of the petals and attached to their bases, rarely opposite their centres; *anthers* adnate to the filaments, oblong, 2-celled, dehiscing longitudinally. *Staminodes* 5-6, bifid, usually opposite the petals. *Ovary* free, usually surrounded by a shallow, cup-shaped, hypogynous disk, more or less 3-celled below, 1-celled above; *style* simple, terminal, stigma 3-lobed; *ovules* 3, linear, pendulous from the apex of a central placenta. *Fruit* more or less covered by the accrescent fleshy calyx; *stone* crustaceous, 1-celled, 1-seeded. *Seed* inverse, albuminous; *embryo* minute, in the apex of albumen; *radicle* superior.—DISTRIB. 25-30 species, natives of the tropics of the Old World.

1. OLAX IMBRICATA, Roxb. Fl. Ind. I, 164. A scandent unarmed

shrub; young branches terete, puberulous when very young. *Leaves* coriaceous, oblong-lanceolate to ovate-oblong, acute, the base rounded or narrowed; both surfaces glabrous, the upper shining, reticulate, the lower dull and the nervation indistinct; main nerves 8 or 9 pairs, faint, spreading; length 3·5 to 5·5 in., breadth 1·25 to 2·75 in., petiole ·2 to ·35 in. *Racemes* about ·5 in. long, many-flowered; the bracts rather large, ovate, concave, imbricate when young, deciduous. *Flowers* about ·5 in. long; petals 6, united in pairs. *Fertile stamens* 3, about as long as the pale staminodes. *Fruit* sub-globose, the apex truncate, ·5 in. in diam., enveloped except at the apex by the accrescent calyx. Wall. Cat. 6775; A. B. Decaisne Nouv. Ann. Mus. III, 438; Miq. Fl. Ind. Bat. I, Pt. I. 785; Hook. fil. Fl. Br. Ind. I. 577; Kurz For. Flora Burma I, 234; Valetton, Olacineæ, 115.

Andaman and Nicobar Islands, Malacca. **DISTRIB:** Java, Philippines, Burmah, Chittagong.

Although I have not included *O. merguensis*, Planch as a synonym of this, I cannot see how it can be specifically separated. *O. Wightiana*, Wall. also appears to me to resemble this too closely to be kept distinct as a species.

## 2. *HARMANDIA*, Pierre.

Trees with alternate, simple, entire, petiolate leaves. *Flowers* unisexual, racemose, pedicellate, solitary in the axils of bracteoles. *Calyx* cupular, entire or 4-toothed, greatly enlarged and persistent in the fruit. *Corolla* campanulate or urceolate, fleshy, with 4 short acute valvate lobes (in the female flowers 6-to 8-lobes?) *Disc* short, thin, annular, crenulate, deciduous, embracing the outside of the base of the cylindric staminal tube. *Anthers* 4, sessile, inserted at the mouth of the thick fleshy staminal tube opposite the teeth of the corolla, bilocular, introrse, the apices reflexed, the connective thick. *Pistil* superior, pyramidal, surrounded in the female flower by the barren staminal tube, 1-celled; *stigma* 3-lobed, sessile; *ovules* 2 (usually only 1), short, free, descending from the apex of the short trigonous central placenta. *Drupe* oblong, 1-seeded, surrounded at the base by the large, fleshy, spreading, coloured accrescent calyx; *epicarp* fleshy, *endocarp* ligneous. *Seed* solitary, filling the cavity of the fruit, its testa thin and inseparable from the fleshy albumen; *embryo* minute, excentric, oblique, near the apex of the allumen. *Cotyledons* flat, shorter than the radicle. **DISTRIB.** 2 species; both Malayan.

This genus founded by M. Pierre (Bull. Soc. Linn. Paris, No. 97, p. 770), is remarkable in having a fleshy staminal tube very like that of some *Meliaceæ*, and for the enormous development of the accrescent calyx which forms a large coloured collar round the ripe fruit.



1. *HARMANDIA KUNSTLERI*, King, n. sp. A glabrous tree 30 to 40 feet high; young branches slender, striate. *Leaves* coriaceous, ovate-lanceolate or lanceolate, shortly and bluntly acuminate, the base cuneate; main nerves about 6 pairs, very indistinct on both surfaces; length 2·5 to 3·5 in., breadth 1 to 2 in., petiole ·25 to ·5 in. *Racemes of female flowers* axillary, solitary, not much longer than the petioles. *Flowers* ·15 in. long, solitary in the axils of oblong obtuse bracteoles. *Calyx* flat, spreading, with 4 very obtuse teeth. *Corolla* four times as long as the calyx, urceolate; teeth 4, acute. *Ovary* hidden (except the stigmas) by the barren staminal tube and by the corolla, pyramidal, the style short; 1-celled with a single spuriously erect ovule: *stigma* solitary, capitate. *Fruit* oblong, obtuse, 1·25 in. long, and ·6 in. in diam., surrounded at the base by the greatly enlarged coloured corrugated calyx which forms a frill 3 to 4 in. in diam.

Perak; King's Collector.

A very striking plant. The accrescent calyx forms an enormous waxy collar round the base of the fruit which, at first green, changes into a beautiful flesh-colour, the central part being bluish-black. This species is closely allied to *Harmandia mekongensis*, Pierre (For. Flora Coch. China, t. 264), from which it differs in having an urceolate (not tubular-campanulate) corolla and a larger fruit with the accrescent calyx less invaginated at the base.

### 3. *OCHANOSTACHYS*, Mast.

Trees or shrubs. *Leaves* alternate, petiolate, penni-nerved. *Flowers* numerous, on long slender branching axillary spikes. *Calyx* cup-shaped, 4-5-toothed, not accrescent. *Petals* 4-5, free, valvate. *Stamens* 12-15, hypogynous, or adherent to the base of the petals; filaments subulate, glabrous; *anthers* 4-celled, opening longitudinally; *staminodes* 0. *Disk* hypogynous, fleshy, very shallow, annular, inconspicuous; *ovary* free, sub-hemispheric, incompletely 3-celled beneath, 1-celled above; *style* short, cylindric; *stigma* minute, terminal, 3-lobed; *ovules* 1 in each cell, pendulous from the apex of a central placenta. *Fruit* drupaceous, 1-celled, 1-seeded.—*DISTRIB.* Species 1 or 2; natives of the Malay Peninsula and Borneo.

1. *OCHANOSTACHYS AMENTACEA*, Mast. in Hook. fil. Fl. Br. Ind. I, 579. A tree 30 to 40 feet high; young branches glabrous, the tips alone puberulous. *Leaves* thinly coriaceous, elliptic-oblong, entire, bluntly sub-acuminate, the base slightly narrowed, both surfaces glabrous; main nerves 5 (rarely 4) pairs, ascending, prominent on the lower, depressed on the upper surface when dry; length 3 to 5 in., breadth 1·5 to 2·5 in., petiole ·5 to ·75 in. *Racemes* as long as or longer

than the leaves, narrow, sometimes branched, axillary, interrupted. *Flowers* on short pedicels with minute ovate, acute bracts at the base; oblong-ovate in bud, less than .1 in. long. *Petals* ovate, glabrous outside with a few coarse hairs inside. *Ovary* vertically striate. *Fruit* ovoid-pyriform, 1.25 in. long, and .8 in. in diam.; the pericarp glabrous, thin, the endocarp bony, with one large cell and a single seed. Valetton, *Olacineæ*, 104. *Petalinia bancana*, Beccari in *Malesia*, I, 257.

In all the provinces except the Andaman and Nicobar Islands. Common.—DISTRIB. Borneo.

This is a very common tree in the Malayan Peninsular where its vernacular name is "Petaling." The same name is applied to it in Borneo, and of this name Beccari's *Petalinia* is an adaptation.

#### 4. BRACEA, nov. gen. King.

Arboreous; *leaves* alternate, simple, entire, petiolate. *Panicles* few-branched, axillary or terminal, nearly as long as or longer than the leaves. *Flowers* hermaphrodite, small, shortly pedicelled, scattered or sub-glomerulate, minutely bracteolate. *Calyx* of 5, free, imbricate, broad, non-acrescent, campanulate sepals. *Petals* 5, hypogynous, slightly united at the base, much imbricate, glabrous. *Stamens* 5, opposite the petals; filaments shorter than the anthers, very broad. *Anthers* ovate, innate, 2-celled, with introrse longitudinal dehiscence. *Staminodes* none. *Ovary* broadly ovate, pyramidal, tapering to the short style, imperfectly 2-celled at the base, 1-celled towards the apex; *stigma* small, 2-lobed. *Ovules* 2, from a short axile basilar placenta. *Fruit* drupaceous, 1-celled, with a single spuriously erect seed.

A genus near *Ochanostachys*, Oliver; but with only 5 stamens, very different in form from those of that genus. I dedicate this to Mr. L. Brace, formerly Curator of the Calcutta Herbarium.

1. BRACEA PANICULATA, n. sp., King. A glabrous tree 50 to 70 feet high; young branches dark-coloured, smooth. *Leaves* coriaceous, ovate to elliptic, sub-acuminate, the base rounded; upper surface shining, the lower dull; main nerves 7 or 8 pairs, curved, spreading, slightly prominent beneath when dry; length 3.5 to 8.5 in., breadth 1.85 to 2.75 in., petiole .65 to .8 in. *Panicles* with few, spreading, spike-like branches. *Flowers* .1 in. long, on pedicels of about the same length, glabrous, the calyx half as long as the corolla; petals and sepals broadly ovate. *Stamens* shorter than the petals, glabrous; *disk* hypogynous. *Fruit* drupaceous, ellipsoid, blunt, glabrous (unripe), .75 in. long, and .4 in. in diam.; the calyx persistent at its base, but not accrescent; *pericarp* fleshy, *endocarp* leathery. *Seed* solitary, attached to the base of the cell.

Perak; Scortechini, No. 288, King's Collector, No. 8086.



## 5. STROMBOSIA, Blume.

Trees or shrubs. *Leaves* alternate, petioled, simple, penni-nerved. *Inflorescence* shortly cymose. *Flowers* regular, hermaphrodite. *Calyx* a shallow cup, more or less 5-lobed, inferior (partly superior in some species). *Petals* 5, free, hairy within. *Stamens* 5, opposite the petals and adnate to their bases. *Anthers* 2-celled, introrse. *Staminodes* 0. *Ovary* wholly superior, or (in some species) partly inferior, imperfectly 4-5-celled, surrounded by a perigynous lobed disk. *Style* simple. *Ovules* 4-5, pendulous from a central placenta. *Fruit* drupaceous, surmounted by the remains of the calyx-lobes and of the style, stone crustaceous. *Seed* pendulous, embryo minute within fleshy albumen. **DISTRIB.** Species 6, natives of the Western Peninsula, Ceylon and the Malayan Archipelago.

Flowers in pedicelled few-flowered cymes ... 1. *S. javanica*.

Flowers in sessile many-flowered fascicles ...

Leaves ovate to oblong-ovate; petals .2 in.

long ... 2. *S. multiflora*.

Leaves more or less rotund; petals .15 in.

long ... 3. *S. rotundifolia*.

1. STROMBOSIA JAVANICA, Blume Bijdr. 1154. A tree 20 to 50 feet high; young branches rather slender, glabrous. *Leaves* thinly coriaceous, glabrous, oblong to elliptic, shortly acuminate, the base rounded; main nerves 5 or 6 pairs, curved, ascending, slightly prominent beneath; length 4 to 7 in., breadth 1.65 to 2.65 in., petiole .6 to .75 in. *Cymes* axillary, not longer than the petioles, few-flowered; bracteoles small, deciduous, leaving pale scars. *Flowers* ellipsoid in bud, about .2 in. long. *Calyx* nearly flat with 5 short lobes, inferior in the flower; (accrescent and half inferior in the fruit). *Petals* erect, much exceeding the calyx, oblong, obtuse, hairy towards the apex. *Stamens* 5, opposite to, nearly as long as, and adhering to the petals. *Ovary* elongate, tapering into the short style. *Fruit* oblong-ovoid, glabrous, .8 in. long, and .6 in. in diam., the apex crowned by the calyx and disc. Blume Mus. Bot. Lugd. Bat. I, 251; Miq. Fl. Ind. Bat. I, Pt. I, 787; Mast. in Hook. Fl. Br. Ind. I, 579; Kurz For. Flora Burmah, I, 235; Valetton, Olacineæ, 86.

Penang: Wallich. Malacca: Maingay. Perak: King's Collectors.

2. STROMBOSIA MULTIFLORA, King, n. sp. A glabrous tree 50 feet high and upwards; young branches slender, striate, minutely lenticellate, cinereous when dry. *Leaves* coriaceous, ovate to oblong-ovate, acute or shortly acuminate, slightly oblique, rounded at the base, the edges undulate; leaves 5 to 8 pairs, slightly curved, ascending, slightly prominent on the lower, obsolete on the upper, surface; length 2.5 to 4

in., breadth 1·5 to 2 in., petiole ·35 in. *Flowers* in dense axillary fascicles; pedicels shorter than the flowers, each with several rotund, concave, minute bracteoles, one of which is close to the calyx. *Calyx* a shallow cup with 5 broad rounded concave segments. *Petals* ·2 in. long, much longer than the calyx, erect, oblong, obtuse, their apices re-curved, pubescent on the edges and in the upper fourth of the inner surface. *Stamens* opposite the petals to which their filaments are attached for two-thirds of their length; *anthers* short, ovate. *Ovary* sub-globular, grooved, much shorter than the long cylindric style, *stigma* minute. *Fruit* unknown.

Perak: King's Collector, No. 7824. Penang: Curtis, No. 859.

Evidently a *Strombosia*; the fruit, however, is as yet unknown.

3. *STROMBOSIA ROTUNDIFOLIA*, King. A tree or shrub; young branches rather stout; their bark cinereous, rugose, much lenticellate. *Leaves* coriaceous, more or less rotund, glabrous; main nerves 6 or 7 pairs, rather straight, sub-ascending, obsolete on the upper, slightly prominent on the lower surface when dry; length 2·5 in., breadth 2 in.; petiole ·3 in., stout. *Fascicles* small, axillary, few-flowered, shorter than the petioles; pedicels short, each with 2 or 3 minute rotund scale-like bracteoles. *Calyx* cupular, with 5 broad rounded imbricate teeth. *Petals* ·15 in. long, much longer than the calyx, oblong, hairy on the upper half inside, otherwise glabrous; *filaments* adnate to the petals for half their length, *anthers* ovate. *Ovary* sub-globular, *style* cylindric. *Fruit* (*fide* Masters) "the size of a pea, glaucous, globose." *Anacalosa Maingayi*, Mast. in Hook. fil. Br. Ind. I, 580.

Singapore: Maingay (Kew Distrib.), No. 1019.

A species closely allied to *S. multiflora*, King, but with differently shaped leaves. The fascicles of this are fewer-flowered, and the flowers are smaller than in that species. I have seen only Maingay's specimen of this, and there is no fruit on it. Dr. Masters puts this plant into *Anacalosa*, but its petals and anthers are those of *Strombosia*, to which genus I venture to remove it.

## 6. *CANSJERA*, JUSS.

Climbing shrubs, sometimes spiny. *Leaves* alternate, entire, penninerved. *Flowers* bracteate, in short axillary spikes, monochlamydeous, hermaphrodite. *Perianth* tubular or urceolate, regular, 4-5-parted, lobes valvate. *Stamens* as many as the lobes of the perianth and opposite to them; filaments glabrous, free, or attached between the fleshy thick lobes of the disk. *Anthers* small, oblong, adnate, 2-celled, dehiscing longitudinally. *Ovary* superior, ovoid-conical, 1-celled. *Style* cylindric; *stigma* capitate, 4-lobed. *Ovule* solitary, erect, or pendulous



from a short placenta. *Fruit* superior, drupaceous, surrounded at the base by the marcescent perianth; sarcocarp thin, endocarp bony. *Seed* solitary, erect, roundish; embryo in the upper part of the fleshy albumen, radicle superior; cotyledons sometimes 3, very long, plano-convex. **DISTRIB.** Species 3–4, natives of Tropical Asia and Australia.

**CANSJERA RHEEDII**, Gmel. Syst. I, 280. A climbing shrub; the young branches olivaceous, puberulous, sometimes spiny. *Leaves* thinly coriaceous, oblong-lanceolate to ovate, acute or acuminate, the base slightly narrowed, both surfaces glabrous; main nerves 3 to 5 pairs, curved, ascending, faint; length 2·5 to 4 in., breadth 1 to 1·5 in., petiole ·15 in. *Spikes* 1 or 2 from an axil, ·5 to 1 in. long, tomentose; bracteoles minute, linear-lanceolate, one at the base of each flower. *Flowers* ·1 in. long, pubescent externally, apices of the teeth of the perianth re-curved. *Fruit* ovoid, ·4 in. long, glabrous; embryo straight in the axis of copious albumen. Wall. Cat. 1043, B; Wight Ic. t. 1861; Bedd. Flor. Sylvat. Anal. Gen. t. xxvi.; Thwaites Enum. 251; Brandis For. Flor. 75; Hook. fil. Fl. Br. Ind. I, 582; Kurz For. Flora Burma I, 237; Valetton Olacineæ 158. *C. scandens*, Roxb. Cor. Pl. 103; Fl. Ind. i. 441. *C. malabarica*, Lamk. Dict. iii. 433. *C. zizyphifolia*, Griff. Notul. iv. 360, t. 537, f. 1. *C. martabanica*, Wall. Cat. 7266. *Olax*? *sumatrana*, Miq. Fl. Ind. Bat. Suppl. i. 342. *Opilia amentacea*, Roxb. Fl. Ind. I, 86 Wall. Cat. No. 2331, *C. Rheede* Hort. Mal. vii. t. 2, 4. Wall. Cat. *Canscora*, No. 7537.

Andaman and Nicobar Islands: Malacca.—**DISTRIB.** British India, Malayan Archipelago.

I can find no trace of calyx in any of the flowers of this species which I have dissected, and I cannot find that the ovary has more than a single cell. The disc is deeply divided into 4 fleshy acute lobes, between which the stamens are inserted. The fruit is entirely superior. The genus is closely allied to *Champereia*, which has already been transferred by Messrs. Benthams and Hooker to *Santalaceae*. It is also allied to *Lepionurus* and *Opilia*; and, with these, it should, in my opinion, be retransferred to the family *Santalaceae* in which its founder, Jussieu, originally placed it. Wall. Cat. 7537 clearly falls here and not under *Lepionurus sylvestris*. Bl.

## 7. LEPIONURUS, Blume.

Shrubby. *Leaves* alternate, shortly petioled, simple, penninerved. *Inflorescence* axillary, spicate, with large deciduous bracts, the flowers solitary at the nodes, or in clusters of 3 or 4. *Flowers* monochlamydeous, regular, hermaphrodite. *Perianth* urceolate, the limb 4-parted; lobes valvate, glabrous within. *Stamens* equal in number to

the lobes of the perianth and opposite to them. *Anthers* glabrous. *Staminodes* 0. *Disk* fleshy, yellow, lining the perianth-tube. *Ovary* free, oblong-conical; *stigma* sessile, 4-lobed; *ovule* solitary. *Fruit* drupaceous, glabrous, endocarp crustaceous. *Seed* erect; embryo small, in the axis of fleshy albumen, radicle terete, cotyledons ternate.—DISTRIB. Species 2, natives of Tropical Asia.

LEPIONURUS SYLVESTRIS, Blume Bijdr. 1148. A glabrous shrub; the branches sub-striate, pale when dry. *Leaves* membranous, oblong, elliptic-oblong or elliptic, shortly acuminate, the base cuneate; main nerves 7 to 9 pairs, rather straight, ascending; length 4 to 6·5 in., breadth 1·4 to 3·5 in., petiole ·15 to ·35 in. *Spikes* axillary, ·5 to 1·25 in. long, solitary, or in clusters of 2 to 6, their rachises filiform, at first enveloped by the large ovate acute, membranous, deciduous bracts. *Flowers* long, the tube inflated and lined by the adherent disc; the lobes deltoid, spreading when mature. *Anthers* and filaments broad. *Fruit* ellipsoid to ovoid, ·35 to ·6 in. long when ripe. Blume Mus. Bot. Lugd. Bat. I, 246; Miq. Fl. Ind. Bat., Vol. I, Pt. I, 284; *Lepionurus oblongifolius*, Mast. in Hook. fil. Fl. Br. Ind. 583; Valetton, Olacineæ, 153. *Leptonium oblongifolium*, Griff. in Calc. Journ. IV, 236. *Opilia acuminata*, Wall. Cat. 7206, also Wall. Cat. 7464.

Malacca, Penang, Perak, rather common. DISTRIB.—British India, Burma, Malayan Archipelago.

I have not been able to make out, from dissections of dried specimens, the exact attachment of the ovule. But the ripe seed is unquestionably attached to the base of the cavity of the fruit. Whether the ovule was originally erect, or was attached in a pendulous manner, as some botanists assert, from the apex of a short central placenta, I am unable to say. The genus in my opinion is closely allied to *Cansjera*.

## 8. CTENOLOPHON, Oliv.

Trees. *Leaves* opposite, petiolate, simple, penni-nerved. *Inflorescence* paniced-cymose. *Flowers* regular, hermaphrodite. *Calyx* 5-parted; lobes imbricate, not accrescent. *Petals* 5, free, imbricate, oblong, reflexed after flowering. *Stamens* 10, free, springing from a short, ring-like, hypogynous disk, those opposite the petals longer than the others; *anthers* roundish, apiculate, 2-celled, dehiscing lengthwise. *Staminodes* 0. *Ovary* free, shortly stalked, imperfectly 2-celled; *style* cylindric, bifid at the apex, stigmas capitate; *ovules* in pairs in each cell, collateral, pendulous. *Fruit* coriaceous or crustaceous, 1-celled, 1-seeded, dehiscing irregularly. *Seed* pendulous from the apex of a free central placenta, and provided with a dorsal pectinate crest.—DISTRIB. 2 known species, both Malayan.



1. Inflorescence pale-tomentose; flowers .2  
to .25 in. long ... 1. *C. parvifolius*.
2. Inflorescence rusty-tomentose; flowers  
.4 in. long ... 2. *C. grandifolius*.

1. CTENOLOPHON PARVIFOLIUS, Oliver in Trans. Linn. Soc. XXVIII, 516, t. 43. A tree; young branches terete, purplish when fresh, cinereous when dry. *Leaves* opposite, coriaceous, elliptic or oblong-elliptic, entire, shortly and obtusely acuminate, the base cuneate or rounded; upper surface shining, the lower dull, both glabrous; main nerves about 10 pairs, faint, spreading, forming a double series of arches within the edge; length 2.5 to 4.5 in., breadth 1.25 to 2 in., petiole .3 to .5 in. *Panicles* terminal and axillary, shorter than the leaves, condensed, minutely cano-tomentose; bracts ovoid-deltoid, minute, deciduous; pedicels stout, about as long as the calyx. *Flowers* .2 to .25 in. long, oblong. *Calyx-lobes* sub-rotund, concave, minutely tomentose outside, sub-glabrous inside. *Petals* coriaceous, erect, oblong, concave, four times as long as the calyx, minutely pale tomentose on the back, the imbricate edges and inner surface glabrous. *Anthers* ovate, adnate, much shorter than the filaments. *Ovary* ovoid-globose, woolly, 2-celled, surrounded at the base by an annular disc: *style* long, cylindric, glabrous, 2-furrowed. *Fruit* ellipsoid, slightly obovoid, apiculate, striate, .6 to .75 in. long, minutely pale tomentose; the pericarp woody, splitting on one side when ripe. *Seeds* with an imperfect pectinate arillus. Masters in Hook. fil. Fl. Br. Ind. I, 579: Beccari, Malesia I, 120.

Malacca: Maingay (Kew Distrib.), No. 382. Perak: Scortechini, Wray, King's Collector.—DISTRIB. Borneo, Beccari, P. B., No. 2637, (*fide* Beccari). Sumatra: Forbes, 3002.

2. CTENOLOPHON GRANDIFOLIUS, Oliver in Trans. Linn. Soc. XXVIII, 517, t. 43, figs. 8 to 10. A tree; the young branches pale, sparsely lenticellate. *Leaves* oblong-elliptic, shortly acuminate, 3.5 to 5 in. long and 1.5 to 1.75 in. broad, otherwise as in *C. parvifolius*. *Panicles* terminal or axillary, almost as long as the leaves, more or less open and spreading, minutely rusty-tomentose; bracts scale-like, caducous; pedicels longer than the calyx. *Flowers* .4 in. long. *Calyx* and *petals* as in *C. parvifolius*, but rufous- instead of pale-tomentose. *Ovary* as in *C. parvifolius*, but the ovarian cavity shorter. *Fruit* unknown. Masters in Hook. fil. Fl. Br. Ind. I, 577. Beccari, Malesia I, 120.

Malacca: Maingay (Kew Distrib.), No. 383.—DISTRIB. Borneo. P. B., No. 1966 (*fide* Beccari).

This species is much rarer than the last. In fact I have seen no other specimens than Maingay's. It closely resembles *C. parvifolius* Oliver, the only tangible differences that I can discover (in the absence

of fruit of this), being the greater size of its flowers, and the colour of the tomentum of the flowers and inflorescence which in this is rusty, whereas in *C. parvifolius* it is pale. Professor Oliver relies as a diagnostic mark on a difference in the length of the ovarian cavity; the cavity of the ovary in *C. parvifolius* reaching nearly to the base of the style, whereas in *C. grandifolius* it occupies the base only of the ovary.

#### 9. XIMENIA, Linn.

A shrub or low tree. *Branches* spiny. *Leaves* shortly petioled, alternate, simple, 1-nerved. *Flowers* racemose, usually hermaphrodite. *Calyx* cupular, 4-5-toothed, persistent, not accrescent. *Petals* 4-5, oblong, revolute, hairy within. *Stamens* twice as many as the petals, hypogynous; *anthers* innate, linear, 2-celled. *Staminodes* 0. *Ovary* sessile, superior, 4-celled; *style* columnar, stigma simple; *ovules* solitary in each cell, pendulous, anatropous. *Drupe* ovoid, 1-celled; *stone* solitary.—DISTRIB. Species, 4-5, 1 Mexican, 1 South African, 1 Bornean, 1 Polynesian, 1 widely dispersed through the Tropics of both hemispheres.

1. XIMENIA AMERICANA, Linn. Sp. Pl. 1193. Glabrous, the young shoots striate and lenticellate. *Leaves* coriaceous, oblong-ovate to sub-orbicular, the apex emarginate, the base rounded; length 1 to 2 in., breadth .75 to 1.25 in. *Racemes* short, axillary, or at the ends of short branches, few-flowered. *Flowers* hermaphrodite or polygamous, .35 in. long; the buds oblong, acute, bracts minute. *Calyx* much shorter than the petals. *Anthers* linear, erect, the connective thick. *Ovary* ovoid-conical, glabrous. *Style* as long as the stamens. *Stigma* simple. *Fruit* oval, glabrous, about 1 in. long, orange-red when ripe, the pericarp pulpy; *endocarp* bony, 1-celled, 1-seeded. Lamk. Illust. 297, fig. 1; DC. Prod. I, 533; Roxb. Fl. Ind. II, 252; W. and A. Prod. 89; Blume Mus. Bot. Lugd. Bat. I, 247; Miq. Fl. Ind. Bat. I, Pt. 1, 786; Hook. fil. Fl. Br. Ind. I, 574; Pierre For. Flor. Coch. China, x. 265; Kurz For. Flora Burma I, 233; Valetton Olacineæ, 74. *X. Russelliana*, Wall. Cat. 6784.

Malacca, Singapore, Nicobar and Andaman Islands :—DISTRIB. Malayan Archipelago; Peninsular India.

#### 10. SCORODOCARPUS, Beccari.

A tall tree. *Leaves* alternate, simple, penni-nerved. *Flowers* dichlamydeous, in short axillary racemes. *Calyx* small, cupular, 4-crenate, not enlarging with the fruit. *Petals* 4 or 5, hypogynous, narrow, valvate, coherent by their edges until mature, lanate internally. *Stamens* twice as many as the petals, attached to them in pairs, dehiscing suturally, the filaments shorter than the linear elongate erect anthers.



*Ovary* ovoid, grooved, imperfectly 4- or 5-celled, with 4 or 5 elongated pendulous ovules. *Style* simple, much longer than the ovary; *stigma* minutely-lobed, terminal. *Fruit* globose, 1-celled, the epicarp thin, fleshy, the endocarp crustaceous. *Seed* solitary, globular, pendulous from the apex by a filiform thread (? placenta), embryo near the apex of the fleshy albumen, radicle superior. One species; native of Malaya.

1. *SCORODOCARPUS BORNEENSIS*, Beccari in *Nuovo Giorn. Bot. Ital.* IX, 273. A tall very foetid tree; branches dark-coloured, lenticellate. *Leaves* coriaceous, elliptic-oblong, acute, the base slightly cuneate or rounded; both surfaces glabrous, the reticulations transverse; main nerves about 5 pairs, curved, ascending, prominent beneath; length 5 to 6·5 in., breadth 2·5 to 3 in., petiole about ·75 in. *Racemes* under 2 in. long, puberulous, the flowers in clusters of 3 or 4. *Calyx* with wavy edge, nearly glabrous. *Buds* oblong; petals puberulous outside, ·3 to ·35 in. long. *Disc* 0. *Fruit* glabrous, 2 in. in diam. Valetton *Olacineæ*, 88. *Schmidelia foetidissima*, Wall. Cat. 8064. *Ximinia borneensis*, Baillon *Adansonia* LXI. 271 (in part).

Singapore: Wallich, Ridley, King. Johore: Ridley. Perak: King's Collector.—DISTRIB. Borneo.

Rather a common tree, every part of which has a foetid alliaceous odour. The wood is hard and durable, and is much prized for various purposes. This tree was collected by Wallich in Singapore, and he referred it to *Schmidelia*. The Wallichian specimens, however, were overlooked, and the plant was first described by Baillon from specimens collected by Signor Beccari in Borneo. Subsequently the latter Botanist founded for its reception, the genus *Scorodocarpus*. Its affinities are with *Ximenia*.

## 11. ANACOLOSA, Blume.

Shrubs or trees. *Leaves* alternate, petiolate, simple, penni-nerved. *Inflorescence* cymose, axillary. *Calyx* cup-shaped, 5-7-toothed, not accrescent. *Petals* 5-7, oblong, free, valvate, springing with the stamens from a hypogynous or perigynous disk. *Stamens* concealed in the cavity of the petals and slightly adnate to their bases, filaments glabrous, or pilose at the apex; *anthers* broad, innate, 2-celled, dehiscing longitudinally. *Ovary* imperfectly 2- 3-celled below, 1-celled above; *style* cylindric, the stigma shortly lobed; *ovules* 2 or 3, pendulous, the placenta central. *Fruit* drupe-like, with the disc persistent at its apex and the slightly accrescent calyx at its base; *stone* crustaceous, 1- or imperfectly 2-celled, with a single pendulous seed; *embryo* minute at the apex of fleshy albumen, radicle superior.—DISTRIB. 5 or 6 species, British Indian and Malayan.

- Calyx and pedicels glabrous ... 1. *A. Griffithii*.  
 Calyx and pedicels minutely rusty-pubescent  
 Leaves membranous; young branches  
 glabrous, dark-coloured; anthers with a  
 tuft of hairs in front ... 2. *A. puberula*.  
 Leaves coriaceous; young branches thick  
 with pale scurfy bark; anthers very  
 hairy ... 3. *A. heptandra*.

1. ANACOLOSA GRIFFITHII, Masters in Hook. fl. Fl. Br. Ind. I, 580.  
 A glabrous shrub or tree; young branches dark-coloured, glaucous.  
*Leaves* thickly membranous, ovate-lanceolate, sub-acute or acute, the  
 base rounded or sub-cuneate; main nerves 5 or 6 pairs, obscure on both  
 surfaces, curved, spreading; length 2·5 to 4 in., breadth 1·2 to 1·5 in.,  
 petiole ·35 in. *Cymes* axillary, few-flowered, sessile or very shortly  
 pedunculate; pedicels longer than the flowers, angled, ebracteolate,  
 glabrous. *Flower-buds* sub-globose. *Calyx* cupular, minutely 5-or 6-  
 toothed, glabrous. *Petals* two or three times longer than the calyx,  
 oblong, obtuse, the upper half thick and fleshy, the lower half concave,  
 hairy towards its upper part, otherwise glabrous. *Stamens* embedded in  
 the concavities of the petals, the filaments short, slender; the anthers sub-  
 globular, hairy in front. *Ovary* conical, flocculent-hairy, tapering into  
 the glabrous style, surrounded at the base by the annular fleshy disk.  
 Kurz For. Flora Burma I, 236; Valetton Olacineæ, 92; Pierre For.  
 Flor. Coch. Chine, t. 266 B.

Burma: doubtfully in the Andaman Islands.

I have seen no specimen of this from the Andamans, but I include  
 it on the authority of the Flora of British India.

2. ANACOLOSA PUBERULA, Kurz in Jour. As. Soc. Bengal, 1872, Pt. 2,  
 p. 297. A large shrub; young branches glabrous, dark-coloured, all  
 parts except the inflorescence glabrous. *Leaves* membranous, oblong-  
 lanceolate, the apex more or less acute, the base slightly narrowed;  
 main nerves 3 to 5 pairs, distant, ascending, pale and prominent on the  
 lower, faint on the upper surface; length 3·5 to 5·5 in., breadth 1·5 to  
 2 in., petiole ·3 in. *Cymes* few- or many-flowered, axillary, about as long  
 as the petioles, their rachises conical, woody: pedicels ebracteolate.  
*Calyx* cupular, with 6 minute distant teeth, rusty-pubescent outside like  
 the pedicels. *Petals* 6, in pairs, oblong, the upper half fleshy; the  
 lower half concave, glabrescent externally, glabrous internally except  
 for a tuft of long hairs at the apex of the concavity. *Stamens* opposite  
 to and as many as the petals, hidden in their concavities; the filaments  
 shorter than the anthers, broad, flat; *anthers* broadly ovoid, tufted,  
 hairy; *disc* large, crenulate, surrounding the base of the conical sub-



glabrous ovary; *stigma* small, minutely lobed. *Fruit* ovoid, glabrescent, .6 in. long, with the persistent disc at its apex and the slightly accrescent calyx at its base. Kurz For. Flora Burma I, 235: Valetton Olacineæ 93.

Nicobar Islands, Kurz.

Var. *Andamanica*. Leaves ovate-elliptic or ovate-lanceolate, main nerves 4 to 6 pairs, spreading, not pale underneath.

Andaman Islands: King's Collectors.

The specimens on which Kurz founded this species are in the Calcutta Herbarium. They were collected in the Nicobar Islands although Kurz, by a slip, attributes them to the Andamans. These Nicobar specimens are distinguished from all which have, since Kurz's time, been collected in the Andamans (where the plant is very common) by the smaller number of nerves in the leaves, which are, moreover, ascending and pale beneath, whereas these from the Andamans have more numerous nerves which are spreading and are not pale beneath.

3. ANACOLOSA HEPTANDRA, Maing. MSS. ex Hook. Fl. Ind. I, 581. A shrub or tree; young branches stout, with pale scurfy bark. *Leaves* coriaceous, oblong-lanceolate, sub-acute at base and apex, glabrous; main nerves 5 or 6 pairs, ascending, obsolete on the upper, rather prominent on the lower surface; length 6 or 7 in., breadth 2.25 to 3 in., petiole .3 in. *Flowers* in crowded axillary cymes not much exceeding the petioles; *pedicels* short, rufous-pubescent like the calyx, ebracteolate. *Calyx* cupular, with 6 minute distant teeth. The other parts of the Flower as in *A. puberula*, but the ovary narrower, and the anthers more hairy, not merely tufted with hairs. Valetton Olacineæ, 93.

Malacca; Maingay (Kew Distrib.), No. 368.

This species of which I have seen only two specimens (neither of which is in fruit) comes very near to *A. puberula*. The young branches however, are thicker, with paler bark, and have the anthers more hairy than in that species.

## 12. PLATEA, Blume.

Trees. *Leaves* entire, coriaceous. *Male flowers* in short axillary interrupted-glomerulose spikes; the females in shorter cymes. *Flowers* polygamo-dicæious. *Sepals* 5, distinct, imbricate, small. *Petals* 5, united below into a tube, the teeth valvate; in the female deciduous or absent. *Stamens* 5, alternate with the petals and inserted at their bases; the filaments short, *anthers* ovoid, 2-celled. *Ovary in the female flower* cylindric, oblong, obtuse, crowned by the large discoid stigma, 1-celled; the ovules 2, pendulous. *Drupe* baccate, the endocarp woody.

*Seed* pendulous, the embryo straight, in the axis of the copious albumen.—DISTRIB. about 4 species; all Malayan.

1. *PLATEA EXCELSA*, Blume Bijdr. 646. A tree 50 to 100 feet high; young branches slender, softly rusty-puberulous. *Leaves* thinly coriaceous, elliptic to oblong, acute or shortly acuminate, the base rounded or very slightly narrowed; upper surface sparsely rufous, puberulous at first, afterwards almost glabrous; lower minutely cinereous-lepidote; reticulations minute, rather distinct and puberulous on both surfaces; main nerves about 7 pairs, spreading, curved, puberulous; length 4·5 to 7 in., breadth 1·75 to 3·5 in., petiole ·5 to ·75 in. *Female flowers* in axillary, 7-or 8 flowered, shortly pedunculate, pubescent, axillary cymes ·5 in. long. *Sepals* ·5 in., broadly ovate, acute, pubescent externally. *Petals* none or early deciduous. *Ovary* cylindric, puberulous; *ovule* (only 1 seen) pendulous, much elongate. *Fruit* narrowly ovoid-ellipsoid, tapering much to the apex, the base rounded 1 to 1·3 in. long, and ·5 in. in diam.; when ripe the pericarp yellowish, thin, glabrous; *endocarp* bony with a few short furrows, *seed* much attenuate at the upper end. Miq. Fl. Ind. Bat. I, pt. 1, 793: Beccari Malesia I, 116: Valetton Olacineæ, 253.

Perak: King's Collector, Wray. Penang: King's Collector, No. 1302. DISTRIB.—Java.

### 13. *GOMPHANDRA*, Wall.

Shrubs or trees. *Leaves* alternate, petioled, simple, penni-nerved, (rarely triple-nerved at the base). *Flowers* polygamo-dioecious, cymose, (practically unisexual). *Calyx* minute, cupular, 4-5-toothed. *Petals* 4 or 5, sometimes united and 4-or 5-cleft; often absent in the female flower. *Stamens* 4 or 5, hypogynous, alternate with the petals; *filaments* thick, flattened, hollowed in front, and attenuate at the apex; *anthers* rather small, pendulous from the apices of the filaments, 2-lobed, the dehiscence longitudinal. *Hypogynous disc* thick, annular, or absent. *Male flower* with rudimentary ovary sunk in the fleshy disc, the stigma minute. *Female flower* with long cylindric ovary and large discoid stigma, 1-celled (2-celled in two species), the ovules 2, collateral, pendulous from the apex, the funicle dilated. *Fruit* elongate, drupe-like, surmounted by the remains of the stigma; *pericarp* smooth, thin, *endocarp* leathery. *Seed* solitary, pendulous; *albumen* fleshy, bi-partite; *embryo* minute.—DISTRIB. 8 or 10 species; Tropics of Asia.

Flowers 4-merous.

Filaments with a large tuft of long white  
glandular hairs on both surfaces near the

apex                      ...                      ...                      ... 1. *G. comosa*.



Filaments with a few white hairs on the posterior surface.

Cymes axillary or terminal ... 2. *G. lanceolata*.

Cymes extra-axillary or leaf-opposed ... 3. *G. penangiana*.

Flowers 5-merous.

Filaments hairy near the apex.

Cymes on stout short peduncles, ovary hairy, fruit .8 in. long ... 4. *G. nyssifolia*.

Cymes on slender peduncles, ovary glabrous

Pedicels of cymes less than half the length of the leaves; fruit .25 to .5 in. long ... 5. *G. Maingayi*.

Pedicels of cymes half as long as the leaves; fruit .65 in. long, imperfectly 2-celled ... 6. *G. gracilis*.

Filaments quite glabrous ... 7. *G. andamanica*.

1. *GOMPHANDRA COMOSA*, King, n. sp. A glabrous tree or shrub, young branches cinereous. *Leaves* thinly coriaceous, oblong to elliptic-oblong, shortly acuminate, much narrowed at the base; main nerves 6 to 8 pairs, sub-ascending, faint; length 3.5 to 6 in., breadth 1.5 to 2 in., petiole .35 to .6 in. *Cymes* on slender pedicels about as long as the petioles, umbellulate; cymules 3 to 5, each with 2 to 3 flowers. *Flowers* sessile, .2 in. long, the buds obovate-globose. *Calyx* shallow, the edge wavy and obscurely 4- or 5-toothed. *Petals* 4, four or five times longer than the calyx, broadly oblong, obtuse, with an inflexed sub-apical point, glabrous. Connective and upper part of filament densely covered with long, white, glandular-pointed hairs. *Ovary* short, ovoid, conic, immersed in the fleshy annular disk, *style* short. *Fruit* narrowly ellipsoid, glabrous, vertically grooved, 1 in. long, and .4 in. in diam., epicarp thin, endocarp cartilaginous, one-celled, 1-seeded.

S. Andaman; King's Collector's.—DISTRIB. Java.

The hairs on the filaments are white and very numerous, and they have conspicuous glandular apices. The ovary above described is that found in flowers bearing perfect anthers. It is probable that it aborts, and that fertile ovaries are confined to flowers (as yet undiscovered) in which the stamens are imperfect.

2. *GOMPHANDRA LANCEOLATA*, King. A shrub 5 or 6 feet high; young branches thin, puberulous. *Leaves* sub-coriaceous, lanceolate or oblong-lanceolate, sometimes very narrow, acuminate, the base cuneate; upper surface glabrous, the lower sparsely puberulous; main nerves about 5 pairs, spreading; the tips ascending, faint; length 2 to 6 in.,

breadth .4 to 1.5 in., petiole .15 to .3 in. *Cymes* axillary and terminal, their pedicels several times as long as the petioles, usually 3, trichotomous; the cymules 3- to 10-flowered, pubescent or glabrescent. *Flowers* sessile, .15 in. long, buds clavate with truncate apices. *Calyx* cupular, with 3 or 4 small obscure teeth. *Petals and stamens of the male flowers and female flowers* as in *G. penangiana*. *Lasianthera lanceolata*, Mast. in Hook. fil. Fl. Br. Ind. I, 585. *Stemonurus tomentella*, Valetton (not of Beccari) *Olacineæ*, 237.

Malacca: on Mount Ophir, Griffith. Perak: King's Collector, Wray, Scortechini, common.

This is rather a variable species as regards the form of leaf and the amount of pubescence on the inflorescence, but the characters of the flowers are constant. For two of the best-marked of these forms I propose varietal names as below.

Var. *angustifolia*, King: *leaves* narrowly oblong-lanceolate, 2 to 6 in. long, and .4 to .7 in. broad: *fruit* ovoid with a long apiculus, also contracted at the base, .5 in. long. Wall. Cat. *Olacineæ*, No. 7570.

Singapore, Wallich. Penang, Curtis, Nos. 737 and 1265. Perak: Scortechini, King's Collector, No. 4211.

Var. *triplinervis*, the two lower lateral main nerves bold and continued nearly to the apex of the leaf.

Perak; Scortechini, No. 375.

3. GOMPHANDRA PENANGIANA, Wall. Cat. 7204. A glabrous or subglabrous shrub 3 to 8 feet high; young shoots thin, pale. *Leaves* shortly membranous, oblong, oblong-lanceolate or elliptic, shortly acuminate, the base cuneate; main nerves 5 to 9 pairs, spreading or ascending, slightly prominent; length 4.5 to 7 in., breadth 1.5 to 2.75 in., petiole .25 to .35 in. *Cymes* extra-axillary or leaf-opposed, pubescent, trichotomous, spreading, many-flowered, their peduncles longer than the petioles, erect. *Flowers* .15 in. long, on short glabrous or pubescent pedicels. *Calyx* a shallow glabrous cup with 3 or 4 obscure broad teeth. *Corolla* in bud cylindric-clavate, the apex truncate, four or five times as long as the calyx, glabrous. *Petals* 4, oblanceolate (the apex inflexed), hyaline. *Filaments* flat, thick, tapering to each end, with a tuft of few long pale glandular hairs near the apex behind the insertion of the anther. *Rudimentary ovary* narrowly ovate, small, half-immersed in the deep fleshy lobed disk. *Cymes of female flowers* longer than the males, secund; *calyx* as in the male: *corolla* absent. *Ovary* elongate, cylindric, glabrous, crowned by a large discoid *stigma* wider than itself, one-celled with 2 elongated ovules pendulous from the apex. *Fruit* ovoid or elliptic, constricted at base and apex, vertically ridged, glabrous, crowned by the persistent stigma, .5 to .7 in. long. Masters in



Hook. fil. Fl. Br. Ind. I, 587. *Stemonurus penangianus*, Miers Contrib. I, 90; Kurz For. Flor. Burm. I, 238. Wall. Cat. 3718. *G. axillaris* (in part).

Penang; Wallich, Curtis. Perak; Scortechini, King's Collector, Wray; very common.

4. GOMPHANDRA NYSSIFOLIA, King. A tree 15 to 40 feet high; young branches dark-coloured, slightly winged under the nodes. *Leaves* coriaceous, elliptic-ovate, abruptly and shortly acuminate, the base cuneate; main nerves rather straight, ascending, prominent on the lower surface, the transverse veins distinct, ovary sub-horizontal; length 3·5 to 5·5 in., breadth 2 to 2·5 in., petiole ·3 in. *Cymes* axillary, sometimes 2 together, their pedicels shorter than or as long as the petioles; flowers 4 to 6, sessile, ·25 in. long. *Female flower*: calyx cupular, with 5 minute distant teeth or sub-entire; *petals* 5, puberulous outside, 5 or 6 times as long as the calyx. *Filaments* flat, with a few white short hairs just below the anther, especially in front. *Disk* adherent to the base of the ovary, glabrous. *Ovary* cylindric, as long as the petals, puberulous, crowned by the large discoid lobed stigma. *Fruit* ellipsoid, slightly clavate, glabrous, ridged, crowned by the persistent stigma, ·8 in. long, and ·35 in. in diam.

Perak: Scortechini, King's Collector, Nos. 6406 and 6984.

I have not seen the true male flowers of this species.

5. GOMPHANDRA MAINGAYI, King. A glabrous shrub 4 to 6 feet high; young branches rather stout, dark-coloured, glabrous. *Leaves* sub-coriaceous, oblong-lanceolate and acuminate, or sub-rhomboidal acute, the base cuneate; main nerves 5 or 6 pairs, rather straight, ascending, prominent beneath; length 2 to 3·5 in., breadth ·9 to 1·2 in., petiole ·25 in. *Peduncles* longer than the petiole, slender; *cymules* 2 or 3, umbellulate, each 4- to 5-flowered. *Flowers* ·15 in. long, sessile. *Calyx* cupular, tomentose, with 4 or 5 shallow teeth. *Petals* 5, four or five times as long as the calyx, rather thick, oblong, sub-acuminate, the apex inflexed, the midrib dark. *Filaments* pointed at the apex and with small tufts of long white sub-apical hairs; *anthers* pendulous from the apex of the filaments. *Rudimentary ovary* and disk absent. *Female flower* unknown. *Fruit* (*fide* Masters) ovoid, ·25 to ·5 in. long, 1-celled, 1-seeded. *Stemonurus Maingayi*, Valetton Olacineæ, 236. *Lasianthera Maingayi*, Mast. in Hook. Fl. Br. Ind. I, 585.

Malacca: Maingay (Kew Distrib.), No. 374<sup>2</sup>. Penang: Curtis.

Known only by Maingay's and Curtis's scanty specimens. It is possible that under these there may really be two species: for Maingay's specimens divide themselves into two sets; one with sub-rhomboid acute leaves which bear the flowers described above; the other with narrowly

oblong-lanceolate leaves and which have neither flowers nor fruit. It is possible that the second set belong to an undescribed species.

6. *GOMPHANDRA GRACILIS*, King, n. sp. A glabrous shrub or small tree; young branches thin, pale. *Leaves* membranous, lanceolate or ovate-lanceolate, acuminate, the base much narrowed, the edges slightly recurved when dry, wavy and sub-crenulate; main nerves 6 or 7 pairs, spreading, faint. *Peduncles* axillary and terminal, nearly half as long as the leaves; the cymes trichotomous, compound, the ultimate cymules umbellate. *Male flowers* .1 in. long, the buds sub-globular; *Calyx* cupular, shallow, with 5 minute teeth; *petals* 5, oblong, glabrous, reflexed, 4 or 5 or 6 times as long as the calyx. *Filaments* 5, thin, flat, attenuate upwards, bearing a tuft of white bulbous-pointed hairs below the small anther. *Female flower* with calyx and abortive stamens like the male, the petals (if any) deciduous. *Ovary* long, cylindric, glabrous, crowned by the large pileate stigma, 2-celled, one of the cells usually empty, the other with a single long ovule suspended from its apex. *Fruit* ellipsoid, flat on one side, curved, glabrous, striate, about .65 in. long, imperfectly 2-celled and with a single pendulous seed.

Perak: Wray, King's Collector; common.

A species readily distinguished by its small flowers globular in bud, and by its curved imperfectly 2-celled fruit.

7. *GOMPHANDRA ANDAMANICA*, King. A tree; young branches tawny-puberulous. *Leaves* thinly coriaceous, oblong or elliptic, shortly and rather abruptly acuminate, the base round or narrowed, sometimes oblique; main nerves 8 or 9 pairs, curved, ascending, prominent beneath and depressed above when dry; length 5 to 8 in., breadth 2 to 3 in., petiole .4 to .6 in. *Cymes* in the axils of leaves or of fallen leaves, often 2 together, .5 to .8 in. in diam., many-flowered, dense, rusty-pubescent, their peduncles stout and .4 or .5 in. long. *Flowers* nearly .15 in. long, sessile, globose-obovate in bud. *Calyx* cupular, thin, irregularly and minutely 4-5-toothed, tomentose externally, and glabrous internally like the petals. *Petals* 5, oblong-ob lanceolate, spreading, the apices curved, three times as long as the calyx. **MALE FLOWERS:** *stamens* 5, as long as the petals, free, the filaments quite glabrous; *disk* hypogynous, fleshy, embracing the base of the narrowly ovoid small rudimentary ovary. *Female flower:* calyx as in the male; petals and stamens not seen; *ovary* narrowly ellipsoid, with a short constriction at the apex, stigma disciform. *Fruit* compressed-ellipsoid, about 1 in. long, slightly convex on one side, deeply grooved on the other; the pericarp glabrous, vertically striate, thin; the endocarp leathery, 2-celled, one cell without a seed, and divided by vertical false dissepiments into several chambers, the other cell occupied by a single pendulous flat seed



bent vertically on itself at right angles. *Apodytes andamanica*, Kurz, Journ. As. Soc. Bengal, 1872, II, 296; Hook. fil. Fl. Br. Ind. I, 587.

Andaman and Nicobar Islands; Kurz. Narcondam Island; Prain.

This species was published as an *Apodytes* by Kurz. The stamens ovary and fruit however are exactly those of *Gomphandra*, to which genus I therefore transfer it. In *Apodytes* the stamens have long narrow anthers and short filaments, while the style is oblique and ex-centric, more or less curved, and the stigma small, the fruit being more or less orbicular or reniform with the scar of the stigma lateral.

#### 14. LASIANTHERA, Pal. de Beauv.

Trees or shrubs, sometimes scandent. *Leaves* alternate, simple, penni-nerved, coriaceous. *Flowers* dichlamydeous, bisexual, in stalked axillary cymes. *Calyx* minute, cupular, 4- or 5-lobed. *Petals* 5, free or rarely cohering, the apex inflexed. *Stamens* 5, hypogynous, free, alternate with the petals; the filaments flat, broad, the connective dilated behind and bearing a tuft of long hairs curving over the anther in the bud; *anthers* adnate, 2-lobed, dehiscing lengthwise. *Hypogynous disk* cup-shaped, more or less corrugated. *Ovary* ovoid, 1-celled, tapering into a subulate style, terminated by a minute stigma; *ovules* 2, pendulous. *Fruit* drupaceous; *stone* fibrous outside, woody within. *Seed* pendulous; *embryo* in albumen, cotyledons leafy and broad, radicle superior.—DISTRIB. Species 4, one African, the others Malayan.

The genus *Stemonurus*, as originally constituted by Blume in 1825, contained three species. One of these has been referred by Messrs. Bentham and Hooker to the older genus *Lasianthera*, which was founded by Palisot-Beauvois in 1805; while the other two species of Blume, viz., *S. parviflorus* and *S. javanica*, have been placed in the genus *Gomphandra* Wall. as defined by Lindley (Nat. Syst. Ed. II, p. 439).

This arrangement is not, however, accepted by all botanists who have written concerning these genera. Miers (Contrib. I, 80) for example considers *Gomphandra* Wall. and *Stemonurus*, Bl. as identical, and both as undistinguishable from *Lasianthera*, Pal-Beauv.; while Beccari (Malesia I, pp. 107, et seq.) keeps up all three genera, and in this, he is followed by Valetton (Olacineæ pp. 207, et seq.). M. Baillon, like Miers, includes the other two in *Lasiandra* which however he places in the natural family *Terebinthaceæ*. Dr. Masters (in Hooker's Flora of British India) follows Messrs. Hooker and Bentham, and I do so also. I have, however, modified the generic characters of *Lasianthera* and *Gomphandra*, and I have not followed Dr. Masters altogether in his allocation of the species. I find the best characters to distinguish *Gomphandra* from *Lasianthera* to be these:—*Lasianthera*, flowers truly hermaphrodite, stigma minute,—*Gomphandra* flowers practically unisexual, the stameniferous flowers having rudimentary ovaries and the seed-producing flowers having large cylindric ovaries with large discoid stigmas, and usually abortive stamens.

Ultimate branches of the inflorescence scor-  
poid cymules 1·5 in. or more in length ... 1. *L. secundiflora*.

Ultimate branches of the inflorescence about  
·25 in. long.

Leaves cuneate-obovate ... 2. *L. umbellata*.

Leaves elliptic-oblong or elliptic-acu-  
minate ... 3. *L. malaccensis*.

1. *LASIANThERA SECUNDIFLORA*, Miq. Fl. Ind. Bat. I, Pt. I, 792; Suppl. 342, t. 2, pp. 43 and 403. A glabrous tree 40 to 60 feet high; young branches stout, dark-coloured. *Leaves* coriaceous, elliptic or ovate-elliptic, very shortly and bluntly acuminate or obtuse, the base rounded or narrowed; the midrib prominent on the lower surface, depressed on the upper; main nerves about 10 pairs, ascending, curving slightly, not much more prominent when dry than the secondary nerves and wide reticulations; length 5 to 10 in., breadth 2·25 to 4 in.; petiole ·5 to ·75 in., stout. *Peduncles* solitary, longer than the petioles, woody, each bearing at its apex an umbel of 6- to 9-flowered secund subscorpioid cymes. *Flowers* sessile, ebracteate, ·25 in. long. *Calyx* short, puberulous. *Petals* glabrous, four or five times as long as the calyx, oblong, sub-acute, each bearing a fleshy conical inflected process slightly below the apex. *Filaments* flattened, tapering to the base; the connective thick, bearing a dense tuft of white hairs as long as the stamen. *Ovary* furrowed, shorter than the stamens but longer than the style. *Fruit* narrowly ellipsoid, 2·5 in. long, and 1 in. in diam., tapering to each end, glabrous, vertically grooved; epicarp thin, mesocarp fibrous, endocarp thin and bony; embryo half as large as the albumen, cotyledons foliaceous, cordate, radicle superior. *Stemonurus secundiflorus*, Blume Bijdr. 649; Mus. Bot. Lugd. Bat. I, t. XLV; Beccari, Malesia, Vol. I, t. IV, figs. 16 and 17; Valetton, Olacinae 234.

Singapore, Johore: Ridley. Perak: King's Collector, Wray.  
DISTRIB.—Java, Sumatra.

2. *LASIANThERA UMBELLATA*, King. A glabrous tree 50 to 60 feet high (or a shrub *vide* Beccari); young branches cinereous, terete. *Leaves* coriaceous, cuneate-obovate, the apex rounded or slightly retuse, much narrowed to the base, midrib prominent beneath; main nerves 7 to 9 pairs, ascending, faint; length 2·5 to 3·5 in., breadth 1·25 to 1·8 in., petiole ·5 to ·7 in. *Cymes* longer than the petioles, umbellulate; the 4 to 6 cymules each with 4 or 5 flowers. *Flowers* sessile, ·15 in. long, broad, truncate. *Calyx* nearly half as long as the petals, pubescent, coriaceous, the edge with 5 broad rounded teeth. *Petals* subcoriaceous, elliptic, obtuse at each end and with an inflexed process below the apex, puberulous outside, glabrous inside. *Filaments* attenuated



towards the base. Connective of anthers everywhere densely silky-comose, the anther lobes separated. *Ovary* globose-ovoid, tapering into the short style, 1-celled. *Disk* thin, hyaline, enveloping the base only of the ovary. *Fruit* unknown. *Stemonurus umbellatus*, Beccari, Malesia, I, 115; tav. XV, pp. 5, 6. *Stemonurus intermedius*, Scort. MSS. in Herb. Calc.

Perak: King's Collector, Scortechini.—DISTRIB. Borneo.

3. *LASIANThERA MALACCENSIS*, Mast. in Hook. fil. Fl. Br. Ind. I, 584. A glabrous tree 30 to 40 feet high; young branches cinereous, terete, glabrous. *Leaves* coriaceous, elliptic-oblong to elliptic, shortly and abruptly acuminate, the base narrowed, midrib prominent on the upper, depressed on the lower surface; main nerves about 10 pairs, straight, sub-ascending, faint on both surfaces; length 3 to 4·5 in., breadth 1·2 to 2·25 in., petiole ·3 or ·4 in. *Cymes* slightly longer than the petioles, dichotomous, 8- to 10-flowered. *Flowers* sessile, ebracteate, 2 in. long. *Calyx* with 5 acute teeth, puberulous. *Petals* 3 or 4 times as long as the calyx, otherwise as in *L. secundiflora*. *Filaments* with a small tuft of hairs in front, otherwise as in *L. secundiflora*. *Fruit* unknown. *Stemonurus capitatus*, Beccari, Malesia, I, 114, tav. XV, figs. 7 to 11; Valetton, Olacineæ, 236.

Malacca: Maingay (Kew Distrib.), No. 385. Penang: Curtis, Nos. 912, 957. Perak: King's Collector, Scortechini.

This species has smaller leaves and different cymes from *L. secundiflora*, but the flowers of the two are very much alike.

### 15. GONOCARYUM, Miq.

Trees. *Leaves* alternate, simple, penni-nerved, coriaceous. *Flowers* in long axillary spikes, dimorphous. *Calyx* of 5 free, ovate, imbricate sepals. *Corolla* much longer than the calyx, gamopetalous, tubular, with 5 acute spreading short teeth, slightly inflexed at the very apex, and valvate in æstivation. *Stamens* 5, alternate with the teeth of the corolla, the filaments adherent to its tube, free only towards the apex; *anthers* sub-exserted, alternate with the teeth, oblong, bilocular, dehiscent longitudinally. *Ovary* ellipsoid, seated on the glabrous annular disk, minute, bilocular, the cells (unequal?), uniovulate, the ovule pendulous. *Style* 1, very short, the stigma apical. *Drupe* dry, spongy, 4-gonous, ridged, narrowed to each end, crowned by the small incurved style and stigma; the calyx persistent at its base but not enlarged, 2-celled, the obsolete second cell being represented by a cylindrical cavity in the spongy mesocarp; the epicarp membranous, sub-glabrous in its upper half, puberulous towards the apex; endocarp papery, with a few minute

scattered hairs. *Seed* solitary, flattened, the abortive seed very small, both pendulous.

The genus *Gonocaryum* was first published by Miquel in his Fl. Ned. Ind. Suppl. p. 343, to receive the single species *G. gracile*. The generic description is incomplete as regards the structure of the seed, but the specimens with which the author worked have no seeds. I have had an opportunity of carefully examining these specimens and I find that Miquel's description is, as regards the structure of the ovary which is found in the stamiferous flowers, inaccurate. He describes two styles and stigmas, whereas, I can find only one of each. And to this extent, I have modified as above the generic description. I think it highly probable however, that fertile ovaries occur (as in so many members of this family) in distinct flowers, and that these may possibly have two stigmas like *Pteleocarpa* and *Cardiopteris*. Of such flowers however, there is no trace in the scanty materials on which Miquel founded the genus. There are two fruits however on one of the type specimens, and a transverse section of these shows a vertical cavity in the substance of the thick mesocarp on one side which has all the appearance of an aborted loculus. The single perfect seed which has filled the loculus, is too much decomposed for examination. In their *Genera Plantarum*, Messrs. Bentham and Hooker remark (in a note), that they have seen no specimen of *Gonocaryum* Miq. And without admitting it as a genus of *Olacineæ*, they quote Miquel's generic description. The late Mr. S. Kurz, in a note in Journ. As. Soc. Bengal for 1870, Pt. 2, p. 72, propounded the view that *Phlebocalymna* Griff. MSS., as described by Messrs. Bentham and Hooker (*Genera Plantarum* I, 353) is identical with *Gonocaryum*. Kurz, who had examined the specimens on which Miquel founded *Gonocaryum*, also believed Miquel to be wrong about the cells of the ovary; for he states that "the ovary is really one-celled and, to judge from the sterile fruits, 2-ovuled." The abortive seed in the fruit which Kurz examined was, he continues "suspended from the apex just beneath the acumen, and there can be observed also the rudiment of the second superposed ovule." But Kurz entirely overlooked the cylindrical cavity of the abortive loculus. Dr. Scheffer in (Ann. Jard. Bot. Buitenzorg I, 96), published a note on the genera *Gonocaryum* and *Phlebocalymna*, of neither of which had been seen (as he states) good or authentic specimens. In that paper Dr. Scheffer follows Kurz in reducing *Phlebocalymna* to *Gonocaryum*. Scheffer gives also a definition of *Gonocaryum* which differs a good deal from Miquel's. And he describes two new species of this modified *Gonocaryum* (viz., *G. Teysmannianum* and *G. pyriforme*). I have examined the latter, and I do not find it to be a *Gonocaryum* at all, as Miquel defined the genus. Beccari (*Malesia* I,



122) follows Scheffer, adopts his modified definition of *Gonocaryum*, and adds two new species viz., *G. Selebicum*, and (at p. 256), *G. affine*. In my opinion *Gonocaryum* and *Phlebocalymna* are not identical.

The flowers of the two species *P. Griffithiana* and *P. Lobbianum* (which are accepted as constituting the genus *Phlebocalymna*) have the calyx gamosepalous, deeply 5-lobed, the petals only twice as long as the calyx, fleshy, cohering by their edges, but quite separable from each other, their apices fleshy and inflexed; the buds being shortly cylindrical and obtuse, and the fruit elliptic (not 4-gonous), slightly striate, obtuse at each end with a bony (not spongy) and strictly 1-celled endocarp, and there being no trace whatever of an abortive loculus. If the definition of the genus *Phlebocalymna* be amended in these particulars to it certainly belongs *G. pyriforme*, Scheff. And, judging from the description, (for I have not seen specimens) *G. Teysmannianum* Scheff. and *G. Selebicum* Becc., with almost equal certainty belong to *Gonocaryum*. About the allocation of *G. affine*, Becc., the description in *Malesia* I, 256, is too incomplete to enable me to form an opinion.

Racemes 5 to 12 in. in length, flowers

·2 in. long.      ...      ...      1. *G. longe-racemosum*.

Racemes under 3 in. long: flowers ·1 in. long 2. *G. gracile*.

1. GONOCARYUM LONGE-RACEMOSUM, King, n. sp. A small glabrous tree. *Leaves* coriaceous, elliptic-oblong, shortly acuminate, the base slightly narrowed; main nerves about 4 pairs, ascending, prominent on the lower, depressed on the upper surface, length 5 to 7 in., breadth 2·25 to 3·5 in., petiole ·3 to ·5 in. *Racemes* axillary or from the stem and larger branches, puberulous, slender, 5 to 12 in. long. *Flowers* ·2 in. long, irregularly disposed on the rachis, sometimes in pairs; their pedicels ·1 in. long, pubescent. *Sepals* 5, ovate, imbricate, puberulous. *Corolla* tubular, the teeth small and recurved. *Fruit* obovoid-elliptic, with 4 very bold vertical ridges and numerous striæ, 1·5 to 2 in. long, and 1 in. in diam., glabrescent; *mesocarp* very thick, spongy, distinctly 2-celled, the aborted cell narrowly cylindric.

Singapore; Hullett, No. 851; Ridley, No. 4750. Perak; King's Collector, Nos. 7397, 7663; Scortechini.

2. GONOCARYUM GRACILE, Miq. Fl. Ind. Bat. Suppl. 343. A shrub? *Leaves* as in the last, but slightly obovate. *Racemes* under 3 in. in length, and the flowers only about ·1 in. long, fruit 1·5 in. long. Kurz in Journ. As. Soc. Beng. for 1875, II, 155; For. Flora Burma, I, 240. *G. Wallichii*, Mast. Fl. Br. Ind. I, 590; Beccari, *Malesia*, I, 122; Valetton *Olacineæ*, 245: *Platea Griffithiana*, Miers Contrib. I, 97, (not *Phlebocalymna*, Griff). *Gonocaryum*? *Wallichii*, Mast. in Hook. fil. Fl. Br. Ind. I, 590 (note).

Andamans or Tenasserim ; *Helfer* (Kew Distrib.), No. 817.—DISTRIB. Sumatra ; Lebong Moesie, Teysmann.

I include this species here although it is not clear whether Helfer's specimen was collected in the Andamans or in the Tenasserim Province of Burmah. This differs from *G. longe-racemosa* by its shorter more slender racemes, and much smaller flowers. Other differences will no doubt be found when both plants are properly collected. At present the materials of *S. gracile* are very poor indeed. They are, however, sufficient to demonstrate that the plant so long known as *Phleboclymna Griffithii* does not belong to the same genus as the specimens on which Miquel founded his genus *Gonocaryum*.

#### 16. PHYTOCRENE, Wall.

Climbing shrubs, usually more or less hairy, often prickly ; wood with very large porous vessels and thick medullary rays, but no annual rings. *Leaves* alternate, petiolate, entire or palmately-lobed. *Flowers* dioecious, monochlamydeous ; male in small globose clusters borne on long branching spikes ; female in large solitary globose pedunculate heads. *Male flowers* each with an involucre of 3–5 free pieces ; the perianth single, of 4 pieces, free, or united below and deeply 4-lobed, valvate. *Stamens* as many as the pieces of the perianth and alternate with them, the filaments hypogynous ; *anthers* 2-celled, introrse, dehiscing longitudinally ; *pollen grains* globose, the rudimentary pistil small. *Female flowers* without involucels ; the perianth as in the males, more or less persistent in the fruit ; *staminodes* minute, tooth-like, as many as the pieces of the perianth, or absent. *Pistil* sessile, 1-celled, villous ; *style* thick, tapering ; *stigma* large, sub-capitate or discoid, lobed or emarginate ; *ovules* 2, collateral, suspended from near the apex of the cavity, raphe dorsal, *micropyle* superior. *Drupe*s many, in globose heads, bristly or echinate ; *stone* hard, 1-celled, 1-seeded, pitted externally. *Seed* pendulous ; *embryo* as long as the fleshy albumen ; radicle superior, short ; cotyledons large, flat, appressed.—DISTRIB. Species 8, all natives of India and the Malayan Archipelago.

There is a difference of opinion as to the nature of the organs at the base of the flowers, some authors regarding them as a calyx, while others (e. g. Baillon) regard them as bracteoles. I adopt the latter view, chiefly because these bodies are not isomerous with the inner whorls of the perianth (corolla of some) or with the stamens. A further argument for considering them as bracteoles is found in the allied genus *Miquelia*, in the males of which similar organs are found, and where they are separated from the flower by a long pedicel.



Leaves entire	...	...	...	1. <i>P. oblonga.</i>
Leaves ovate, sometimes 3-lobed			...	2. <i>P. bracteata.</i>
Leaves deeply palmately 5-lobed			...	3. <i>P. palmata.</i>

1. PHYTOCRENE OBLONGA, Wall. Pl. As. Rar. III, 12. Bark brownish, rather rough, striate, not prickly, that of the younger branches puberulous. *Leaves* coriaceous, oblong or oblong-lanceolate, more or less acuminate, entire, the base narrowed; upper surface glabrous, shining, the lower minutely pubescent, minutely lepidote, the reticulations very distinct; main nerves 7 to 9 pairs, curved, ascending, prominent on the lower surface; length 4·5 to 9 in., breadth 2 to 3·5 in., petiole ·6 to 1 in. *Panicles of male flowers* axillary, or clustered on woody warted tubercles on the stem and larger branches, 1 to 2 in. long, and from ·4 to ·5 in. broad, the ultimate branches consisting of minute pedicellate umbellules; the pedicels of the umbellules ·15 in. long, rusty-tomentose, each with a subulate bract shorter than itself. *Flowers* sessile, ·05 in. long, in 4- or 5-flowered umbellules ·15 in. in diam. *Bracts of involucre* free, narrowly deltoid, rufous-sericeous. *Pieces of the perianth* 4, free, ovate, concave, glabrous inside, rufous-sericeous externally. *Stamens* shorter than the perianth, anthers broad. *Rudimentary ovary* minute, sericeous. *Female flowers* in shortly pedunculate globular capitula, ·5 in. in diam., borne on the stem and branches, the peduncle stout, ·25 in. long. *Drupe* cuneate-ovoid, obtuse, 1·5 in. long, and 1 in. in diam.; the base pointed trigonous and strigose; the rest of the surface densely covered with very stout asperulous pale brown bristles, collected in globular heads, the size of a cricket-ball; epicarp leathery, mesocarp pulpy, endocarp crustaceous. *Seed* solitary; cotyledons thin, tortuous, embedded in lobulated fleshy albumen. Baill. in DC. Prod. XVII, 13; Hook. fil. Fl. Br. Ind. I, 592; Wall. Cat., No. 4948. *Gynocephalum oblongum*, Trec. in Ann. Sc. Nat. Ser. 3, VIII, 149.

Penang; Wallich. Malacca; Maingay. Perak; Scortechini, King's Collector.

The female flowers are often diseased, and the petals are converted into a long fleshy tube which contains no trace of ovary.

2. PHYTOCRENE BRACTEATA, Wall. Pl. As. Rar. III, 12. Stems with sharp tubercles; branches striate, minutely prickly when young. *Leaves* coriaceous, broadly ovate, cordate at the base, often 3-lobed and obscurely dentate, the apex acute, upper surface glabrous, the nerves pubescent; lower surface pale, softly and minutely pubescent, reticulations distinct especially on the lower surface; main nerves 4 or 5 pairs, spreading, curved, prominent beneath; length 4 to 8 in., breadth 3 to 5·5 in.; petiole 1·25 to 3 in., minutely tomentose with bristles intermixed. *Panicles of male flowers* bracteate, axillary, 4 to

8 in. long, and from .75 to 1.25 in. broad; the ultimate branches consisting of minute clustered, 6- to 10-flowered, pedicellate umbellules; *bracts* from the bases of the pedicels of the umbellules, .4 or .5 in. long, subulate, curved, hispid. *Flowers* sessile, .05 in. in diam. *Bracteoles of the involucre* 3, deltoid, their apices broad and bifid, glabrous on the inner, densely villous on the outer surface. *Pieces of the perianth* 4, free, ovate-lanceolate, acute, smaller than the sepals, valvate. *Stamens* shorter than the perianth, the anthers broad. *Rudimentary ovary* minute, villous. *Female flowers* (*fide* Griffith) in oblong or spherical pedunculate capitula of which there are several in a leaf-axil. *Style* short, tri-partite; the segments revolute, stigmatiferous on the inner surface. *Ovary* strigose, 1-celled, with 2 pendulous ovules. *Drupe* ovoid, tapering to each end, densely covered with adpressed yellowish bristles, 1.5 in. long, and .75 in. in diam., 1-celled, crowded in dense pendulous globose capitula as large as a man's head. *Seed* solitary, albumen fleshy, radicle broad; cotyledons small, orbicular. Baill. in DC. Prod. XVII, 12; Hook. fil. Fl. Br. Ind. I, 592; Kurz For. Flora Burmah I, 242; Beccari Malesia, I, 127: Wall. Cat. No. 4947. *P. macrocarpa*, Griff. Notul. IV, 322: Ic. Pl. Ind. Or. 487 and 488. *Gynocephalum bracteatum*, Trec. in Ann. Sc. Nat. Ser. 3, VIII, 149, No. 3.

Penang; Porter, Curtis. Malacca; Griffith. Perak; King's Collectors. Singapore; Maingay, Ridley.—DISTRIB. Borneo.

3. PHYTOCRENE PALMATA, Wall. Pl. As. Rar. III, 12. Stem minutely prickly; the younger branches rufous-hispid, striate. *Leaves* coriaceous, reniform, deeply 5-lobed; the lobes oblong, acuminate or acute; upper surface glabrous, the lower densely covered with soft coarse rufous or yellowish hairs; main nerves 5 to 7, palmate, prominent on the upper, depressed on the lower surface; length 7 to 12 in., breadth about the same; petioles 3 to 5 in., densely ferruginous-pilose. *Panicles of male flowers* axillary, 2.5 to 13 in. long, and about 1.5 in. broad, the ultimate branches consisting of minute 12- to 15-flowered, pedicelled, ebracteate umbellules; pedicels .15 in. long, softly pubescent. *Male flowers* as in *P. oblonga*. *Female flowers* in shortly pedunculate axillary ovoid capitula, .5 in. in diam.; the peduncle .25 in. long, pilose. *Flowers* .2 in. long, sessile. *Bracteoles of the involucre* of two deltoid bifid pieces: *corolla* 0. *Ovary* ovoid, pointed, densely hirsute. *Drupe* numerous, ellipsoid, slightly obovoid, tapering much to the base, the apex acute, the whole surface more or less densely covered with yellowish shining stiff hairs; 1.5 to 2 in. long, and .75 in. in diam., collected in sub-globular heads 3 or 4 in. in diam., Baill. in DC. Prod. XVII, 11; Miq. Ann. Mus. Lugd. Bat. III, 248; Hook. fil. Fl. Br. Ind. I, 592; Beccari Malesia, I, 127. *Gynocephalum palmatum*, Trec. in Ann. Sc. Nat. Ser. 3, VIII, 149: Wall. Cat., 4949.



Penang ; Wallich, Curtis. Malacca ; Griffith. Perak ; King's Collector, Wray.

### 17. MIQUELIA, Meissner.

Climbing shrubs, the wood with large vessels. *Leaves* alternate, simple, entire or dentate, petiolate, penni-nerved. *Flowers* dioecious, the males pedicellate and in clustered umbels, the females sessile and in solitary capitula. *Male flowers* each on a long pedicel with a whorl of minute bracteoles at its base. *Perianth* 5-merous, the pieces oblong or lanceolate, free or united at the base, valvate. *Stamens* equal to the pieces of the perianth and alternate with them ; filaments short, anthers linear-oblong, 2-celled, introrse, disk 0. *Rudimentary pistil* small. *Female flowers* ;—bracteoles as in the male, sometimes united by their bases. *Flowers* sessile, the perianth deeply divided into 4 fleshy lanceolate reflexed segments. *Disk* none. *Ovary* solitary, compressed, crowned by the large discoid stigma, 1-celled, with 2 pendulous collateral ovules, raphe dorsal, radicle superior. *Drupe* oblong, more or less compressed, the calyx persistent at its base, the mesocarp thin ; the endocarp crustaceous, rugose externally, often verrucose internally. *Seed* suspended, solitary, with thin testa, albumen fleshy rugulose, radicle superior ; cotyledons elliptic, thick, leafy. Species about 5 Indian and Malayan.

1. MIQUELIA CAUDATA, King, n. sp. A slender climber 10 to 20 feet long ; branches thin, pale, striate. *Leaves* membranous, oblong-lanceolate, shortly acuminate, the base narrowed ; upper surface glabrous, the lower puberulous especially on the midrib and 5 or 6 pairs of spreading, curving, ascending or spreading main nerves ; length 5 to 8 in., breadth 1·5 to 2 in., petiole ·5 to ·65 in. *Umbels of male flowers* ·65 to 1 in. long, in fascicles from pilose tubercles on the stem, axillary or extra-axillary. *Bracteoles of involucrel of each flower* 4 or 5, free or united at the base, lanceolate, pilose. *Pedicels of flower* ·15 to ·2 in. long, pubescent. *Flowers* ·15 in. in diam., the segments of the perianth spreading, puberulous ; *filaments* shorter than the linear-oblong sagittate anthers. *Rudimentary ovary* minute, hirsute. *Capitules of female flowers* ·25 in. long, ovoid, solitary, axillary ; their peduncles 2 to 2·5 in. long, puberulous. *Flowers* sessile, ·15 in. in diam. ; perianth leathery, glabrous. *Ovary* tomentose ; the stigma discoid, depressed in the centre, wider than the ovary, glabrous. *Drupe* broadly ovoid, slightly compressed, rounded and broad at the base, tapering upwards into a long terminal tail crowned by the persistent stigma ; epicarp thin, rusty-pubescent on the surface ; endocarp bony, rough, and pitted on the outer surface, smooth and tubercled on the inner ; length from base to apex 1 to 1·25 in., breadth at base ·6 in.

Perak; Scortechini, King's Collector.

This species is closely allied to *M. Kleinii*, which is a common plant in the forests at the base of the Assam Hill Ranges. This differs from *M. Kleinii* chiefly in its fruit having a long apical tail which is quite absent in the former. The male flowers also differ in the two species. The genus *Miquelia* was founded by Meissner (*Plant. Vasc. Genera*); but Griffith, over-looking Meissner's description, published *M. Kleinii* under the name *Jenkinsia Assamica*, in 1844, in the *Calcutta Journal of Natural History*, Vol. 4. 231, t. 12. A description and figure of the female flowers are to be found in the same author's *Notulæ*, 370; and a figure in his *Icones*, t. 537, fig. 2. Wallich issued the Assam plant as No. 6760 of his *Catalogue* under the name *Zanonia? oblonga*.

#### 18. SARCOSTIGMA, W. and Arn.

Climbing shrubs. *Wood* without zones. *Leaves* alternate, simple, shortly petioled, much reticulate. *Flowers* dioecious, minute, arranged in glomeruli along a long pendulous rachis. MALE fl.: *Calyx* minute, cupular, 4-5 lobed. *Petals* 5, free, or nearly so, valvate, oblong, ultimately reflexed. *Stamens* 5, alternate with the petals, free, or adnate to the base of the petals, filaments glabrous; *anthers* ovate, sagittate, erect, 2-celled, dehiscing longitudinally. *Pistil* rudimentary. FEMALE fl.: *Calyx* and *corolla* as in the male, but shorter and more fleshy. *Staminodes* 4-5, hypogynous, alternate with the petals. *Ovary* superior, sessile, 1-celled; *stigma* sub-sessile, discoid or umbonate; *ovules* 2, collateral, pendulous, funicle thick. *Drupe* oblong, more or less compressed, surrounded at the base by the persistent calyx and corolla; *epicarp* coriaceous; *endocarp* woody, lined with a thin white membrane. *Seed* (according to Baillon) pendulous, exalbuminous; *cotyledons* fleshy, wrapping round the short superior radicle.--DISTRIB. Species 3 or 4, all tropical Asiatic.

SARCOSTIGMA WALLICHII, H. Brongn. in *Adansonia*, X, 282. A powerful climber; young branches pale, puberulous at first, afterwards glabrous like all the other parts except the inflorescence and fruit. *Leaves* coriaceous, shining, much reticulate, oblong to broadly ovate, acute, the base narrowed, under surface sometimes sparsely pubescent; main nerves 5 to 7 pairs, much curved, ascending; length 4 to 7 in., breadth 1.5 to 4.5 in., petiole .4 to .6 in. *Spikes of male flowers* axillary or extra-axillary, solitary or in fascicles, often nearly as long as the leaves, softly rufous-tomentose; *flowers* .1 to .15 in. long, sessile. *Calyx* a membranous, obscurely-toothed cup, rufous pubescent outside, glabrous inside. *Petals* about four times as long as the calyx, lanceolate, spreading, slightly united at the base, the apices inflexed, pubescent outside, gla-



brous inside. *Stamens* shorter than the petals, filaments glabrous. *Rudimentary ovary* ovoid, obtuse, pubescent. *Disk* none. *Female flowers* not seen. *Drupe* ovoid or globular-ovoid, compressed, 1.25 in. long and .75 in. in diam.; *pericarp* leathery, densely rusty-tomentose; *mesocarp* pulpy, rather copious; *endocarp* thinly bony, smooth on both surfaces. Baillon in DC. Prod. XVII, 16; Hook. fil. Fl. Br. Ind. I, 594; *S. edule*, Kurz, For. Flora Burmah I, 242. *Chaillietia edulis*, Wall. Cat. 9030 ("indetermin.") Kurz in Andaman Report, App. 6.

S. Andaman; Kurz, King's Collector.—DISTRIB. Burmah.

Kurz himself (in Herb. Calcut.) reduced his species *S. edule* to *S. Wallichii* Baill., and there is no doubt the reduction is right.

### 19. IODES, Blume.

Climbing shrubs, rarely erect. *Leaves* opposite, or sub-alternate, petiolate, simple, penni-nerved. *Inflorescence* cymose, cymes axillary or extra-axillary; lower peduncles often sterile, cirrose. *Flowers* dichlamydeous, dioecious. MALE fl.: *Calyx* minute, cup-shaped, 5-toothed. *Corolla* 5-merous, lobes valvate. *Stamens* hypogynous, equal in number to, and alternate with the lobes of the corolla; *anthers* basifixed, straight, 2-celled, introrse, dehiscing longitudinally. *Pistil* rudimentary. FEMALE fl.: *Calyx* as in the male. *Corolla* 5-parted, the segments united below. *Staminodes* 0. *Ovary* sub-sessile, 1-celled, with 2 collateral pendulous ovules; *stigma* sessile, discoid. *Drupe* surrounded at the base by the persistent, but not accrescent calyx; *stone* 1-seeded. *Seed* pendulous, testa thin, albumen fleshy; *cotyledons* flat, leafy; *radicle* superior.—DISTRIB. Species about 8, natives of India, the Malayan Archipelago and tropical Africa.

Flowers 4-merous ... .. 1. *I. reticulata*.

Flowers 5-merous.

Calyx cupular with 5 minute teeth ... 2. *I. velutina*.

Calyx deeply divided into 5 lanceolate lobes.

Leaves ovate to rotund, pubescence rufous ... .. 3. *I. ovalis*.

Leaves oblong or oblong-lanceolate; pubescence cinereous ... .. 4. *I. oblonga*.

1. IODES RETICULATA, King, n. sp. A woody creeper 20 or 30 feet long; young branches slender, striate, with a broad line of tomentum on one side, changing sides at the nodes. *Leaves* thinly coriaceous, elliptic or broadly ovate, sometimes slightly obovate, shortly acuminate, narrowed slightly to the rounded or sub-emarginate base; both surfaces minutely but boldly reticulate, the upper glabrous, the lower with long soft hairs especially on the midrib and nerves; main nerves 4 or 5 pairs,

curving, ascending, prominent beneath as are the transverse nervules; length 2 to 5 in., breadth 1·3 to 2·5 in., petiole ·4 to ·6 in. *Cymes* both of male and female flowers terminal and extra-axillary, or occasionally axillary, usually much longer than the leaves, much-branched, and sometimes bearing tendrils, softly olivaceous-pubescent; pedicels longer than the flowers. *Male flowers* less than ·05 in. long, 4-merous, globular in bud. *Calyx* shorter than the corolla, with 4 acute segments, densely pilose outside. *Corolla* with 4 broadly ovate concave lobes, pilose outside and glabrous inside. *Stamens* shorter than the corolla, *anthers* broadly ovate, *rudimentary ovary* minute. *Female flowers* like the males but larger and with the lobes of the corolla reflexed. *Ovary* cylindric, tomentose, crowned by the broad discoid stigma, 1-celled, with 2 pendulous collateral ovules. *Drupe* elliptic, compressed, the apex with a slight apiculus bearing the stigma, the base narrowed; the calyx and corolla persistent but not enlarged, minutely velvety; *endocarp* bony, 4-angled, smooth inside. *Seed* solitary.

Perak; Wray, King's Collector.

The tetramerous very small flowers, and large velvety fruit, distinguish this species. The young branches are sub-glabrous on one side and densely pubescent on the other; at the nodes these two lines cross.

2. *IODES VELUTINA*, King, n. sp. A scandent shrub; young branches slender, terete, shortly rufous-pubescent, especially so on one side. *Leaves* coriaceous, ovate, acute or very shortly acuminate; the base rounded, slightly emarginate; upper surface sparsely and minutely pilose, the midrib tomentose; lower surface densely velvety-tomentose; main nerves about 4 pairs, ascending, curved; length 2·5 to 3·75 in., breadth 1·35 to 2·25 in., petiole ·35 to ·6 in. *Cymes* axillary, terminal or leaf-opposed, longer than the leaves, pubescent, few-flowered, sometimes bearing tendrils. *Male flowers* ·1 in. long, or slightly more, globose-ovoid in bud, on very short pedicels. *Calyx* cupular, with 5 small acute teeth. *Corolla* little more than twice as long as the calyx, with 5 deep oblong concave teeth with inflexed apices, adpressed-pilose externally and glabrous internally like the calyx. *Stamens* nearly as long as the corolla; the filaments short, pilose, the anthers oblong. *Rudimentary ovary* ellipsoid, pilose. *Drupe*s elongated-obovoid, compressed, 4-angled, obtuse or retuse at the apex, the stigma persistent, much narrowed to the base where the corolla and calyx are persistent, minutely cinereous-tomentose, 1·25 in. long, and ·5 in. broad; *endocarp* bony, more or less 8-angled, smooth inside. *Seed* solitary, compressed.

Malacca; Maingay (Kew Distrib.), No. 380, and perhaps No. 1039. Perak; Scortechini, Wray.



The leaves of this resemble those of *I. ovalis*, Bl.; but they are more velvety beneath. The calyx and fruit are much larger than in that species and the cymes have fewer flowers.

3. *IODES OVALIS*, Blume Bijdr. 30. A climbing shrub 20 to 60 feet long; young branches slender, rufous-tomentose, striate, with a few axillary or leaf-opposed tendrils. *Leaves* opposite, sub-coriaceous, ovate to rotund, acute or very shortly acuminate, the base rounded sometimes slightly emarginate; upper surface glaberrulous, the midrib and nerves rufous-tomentose like the whole of the lower surface; main nerves 4 or 5 pairs, curved, ascending, prominent on the lower surface as are the transverse veins; length 2·5 to 5·5 in., breadth 1·75 to 3·25 in. *Male flowers* in leaf-opposed or terminal, much-branched, lax, rufous-tomentose cymes 6 to 8 in. long. *Flowers* ·15 in. in diam., on pubescent pedicels ·1 to ·2 in. long. *Calyx* discoid, irregularly 3- to 6-toothed rufous-villose. *Corolla* 5 or 6 times as long as the calyx, deeply divided into 5 lanceolate lobes with long acuminate inflexed points, strigose externally, glabrous internally; *stamens* much shorter than the corolla-lobes, the filaments much shorter than the broadly ovate anthers; *rudimentary pistil* erect, cylindric, pilose. *Female flowers* with calyx and corolla like the male; *stamens* 0. *Ovary* cylindric, tomentose, crowned by a large discoid stigma wider than itself, 1-celled, with 2 pendulous ovules. *Drupe* ovoid, compressed, slightly oblique at the base, rufous-tomentose, crowned by the persistent stigma, ·75 in. long, and ·5 in. in diam., *pericarp* thin; *endocarp* bony, rugose outside, smooth inside. Mast. in Hook. fil. Fl. Br. Ind. I, 596; Beccari Malesia, I, 124; Baill. in DC. Prod. XVII, 22; *I. tomentella* cum var. Br. in Benn. Pl. Jav. Rar. 243, t. 48; Hassk. Cat. Pl. Hort. Bogor. 172; Miq. Fl. Ind. Bat. i. 795. *I. tomentella*, Miq. Fl. Ind. Bat. I, Pt. 1, 796; Kurz For. Flora Burmah I, 243. *Natsatium oppositifolium*, Planch. in Hook. Lond. Journ. Bot. V, 247.

Malacca; Griffith, Maingay. Perak; Scortechini, Curtis, King's Collector; common.—DISTRIB.—Burmah, Sumatra.

4. *IODES OBLONGA*, Planch. in Hook. fil. Fl. Br. Ind. I, 597. A slender climbing shrub; young branches cinereous-tomentose, ultimately glabrescent and rugose. *Leaves* membranous, oblong or oblong-lanceolate, glabrous above except the pilose midrib and nerves, beneath adpressed-pilose, the midrib pubescent; main nerves 7 or 8 pairs, curving, spreading; length 3 to 4·5 in., breadth 1 to 1·6 in., petiole ·3 or ·4 in. *Cymes of male flowers* axillary or terminal, dichotomously branched, slender, cinereous-pilose. *Male flowers* ·05 in. long. *Calyx* nearly as long as the corolla, with 5 deep lanceolate lobes. *Corolla* rufous-tomentose externally. *Female flowers* and drupes not seen,

Penang ; Phillips, Curtis, No. 2438. Singapore ; King's Collector, No. 1185.

This species has smaller flowers, with a longer calyx, than the last : its leaves are narrower, and its pubescence is cinereous not rufescent.

## 20. ERYTHROPALUM, Blume.

Climbing glabrous shrubs with axillary tendrils. *Leaves* alternate, entire, 3- to 5-nerved at the base. *Cymes* slender, pedunculate, dichotomous ; the cymules umbellate, minutely bracteolate. *Flowers* bisexual. *Calyx* with 5 broad short teeth, imbricate in æstivation, its tube adherent and much enlarged in fruit. *Corolla* perigynous ; *petals* 5, short, broad, spreading, slightly coherent by their bases, inserted outside the large cupular fleshy 5-lobed disc, valvate in æstivation. *Stamens* as many as the petals, opposite to them and slightly attached to their bases, *filaments* short ; *anthers* broadly ovate with lateral longitudinal dehiscence, the connective rather large. *Ovary* half immersed in the disc, tapering to a short terminal style, 1-celled ; *ovules* 1 to 3, pendulous from the apex ; *stigma* minute, 3-lobed. *Fruit* crowned by the persistent calyx-lobes and the disc, oblong, 1-celled ; the pericarp and putamen thin, lined by a pulpy coat, splitting, when dry, into 3 to 5 vertical segments. *Seed* solitary, pendulous ; the embryo minute, lying near the apex of the large fleshy albumen.

To this genus there are attributed in the Flora of British India three species, viz., *E. scandens*, Bl. *E. populifolium*, and *E. vagum*, Mast. Each of the three originally appeared in Botanical literature as the type of a distinct genus. Of these three genera, *Erythropalum* is the oldest and is therefore now retained. It was founded by Blume (Bijdr. 921) in 1826, and was by him referred to the Natural order *Cucurbitaceæ*. As Blume describes the flowers as monœcious, his material was presumably imperfect. For the reception of the second species, Dr. Walker-Arnott, in Jardine's Magazine of Zool. and Bot. for 1838, p. 551, formed the genus *Mackaya*, and in an excellent note he discusses its affinities. Of it he says, "I cannot indicate the natural order, nor even the place in the linear series which it ought to occupy ;" but on the whole he was inclined to regard it as a species of *Olacineæ* near *Schœpfia*, but with perfectly inferior fruit. Walker-Arnott considered it to be also allied to *Santalaceæ*, although differing both from that Order and from *Olacineæ* in the absence of a central columella in its ovary ; while, from *Santalaceæ*, it has the additional difference of possessing a corolla. And he suggests the formation of *Mackaya* and *Schœpfia* into a small calycifloral order connected on the one hand with *Santalaceæ* and on the other with *Olacineæ*. The third species *E. vagum* Mast., was first published by Griffith (Notulæ IV, 633 and Ic. Pl. Ind. Or. t. 628) as the type of a genus which, from its supposed affinity with *Modecca*, be named *Modeccopsis*. The relation to *Modecca* is however superficial, and extends only to a similarity in general habit and in the externals of the fruit. For in structure the flowers of *Modecca* are very different from those of *Modeccopsis*, inasmuch as they have no perigynous (finally epigynous) disc, and the superior ovary



has 3 parietal multi-ovulate placentas, while the fruit is a 3-valved many-seeded capsule. Planchon [Ann. des Sc. Nat. Ser. IV. Bot., Vol. II, p. 260 (1854,)] suggests the formation of a natural order for the reception of the single species *Erythropalum*, a suggestion followed by Miquel; while Baillon puts it (along with *Olacineæ*, *Santalaceæ*, *Ampelideæ*, *Styraceæ*, and *Loranthææ* proper) into his order *Loranthacées*. Messrs. Hooker and Bentham put *Erythropalum* into *Olacineæ*, where, in spite of its affinities with the Cornaceous genus *Nyssa*, it may be left for the present, although its inferior fruit makes its inclusion in *Olacineæ* rather an anomaly. To this genus also without doubt belong *Decastrophia*, Griffith (Notulæ IV, 737); *Erythropalla*, Hassk. Cat. Hort. Bogor, 191; and in all probability (as Valenton suggests) the obscure plant named *Balingayum decumbens* by Blanco (Fl. de Filip. 187.)

1. *ERYTHROPALUM SCANDENS*, Blume Bijdr. 921. *Leaves* membranous, ovate-oblong or elliptic to oblong-lanceolate, acuminate, the base rounded or minutely cordate, sub-peltate; basal nerves 3 to 5, two of them minute; lateral nerves about 4 pairs, distant, faint: length 3 to 6 in., breadth 1·75 to 3·75 in., petiole ·75 to 1·75 in. *Tendrils* (abortive peduncles) simple or bifid, thickened upwards. *Cymes* slender, shorter than the leaves, divaricate, the peduncles long. *Flowers* under ·1 in. in diam. *Fruit* oblong, ellipsoid or slightly obovoid, glabrous, the epicarp yellowish. *Seed* large, ovoid, without testa. Miq. Fl. Ind. Bat. I, Pt, 1, 704; Hook. fil. Fl. Br. Ind. I, 578; Pierre For. Flor. Coch. Chine, t. 269 A; Kurz For. Flora Burma, I, 234; Valeton *Olacineæ* 132; Wall. Cat. 7539 *Menisperma*?; also No. 9033 (without name). *Cocculus calophyllus*, Wall. MSS.

Malacca, Perak:—DISTRIB. Java, Burmah, Tropical Himalaya, Khasia Hills.

Closely allied to, if not identical with, this is *E. vagum*, Mast. And *E. populifolium* Mast. (Wall. Cat. Nos. 1233 BIS. and 2248; *Passiflora Heyneana*, Wall.)

## 21. PTELEOCARPA, Oliv.

Trees. *Leaves* alternate, simple, penni-nerved, petiolate. *Inflor-escence* terminal, paniced, many-flowered. *Flowers* regular, dichlamy-deous, hermaphrodite. *Calyx* tubular below, limb deeply 5-parted, lobes imbricate, not accrescent. *Corolla* tubular below-limb deeply 5-parted, lobes imbricate, glabrous. *Stamens* 5, glabrous, attached to the tube of the corolla, alternate with its lobes; *anthers* linear-oblong, innate, dehiscing longitudinally. *Ovary* free, stipitate, 2-celled; *styles* 2, *stigmas* small; *ovules* solitary in each cell, pendulous, anatropal, raphe lateral or subventral. *Fruit* 2-celled, samaroid, orbicular, emarginate; the wings broad, thin, striate. *Seed* elongate, much compressed, albuminous; *radicle* superior, cylindrical; cotyledons linear-lanceolate, longer than the radicle.—DISTRIB. Species 2, both Malayan.

*PTELEOCARPA MALACCENSIS*, Oliver in Trans. Linn. Soc. XXVIII, 515, t. 42. A tree; young branches terete, glabrous, slender; all parts except the puberulous inflorescence glabrous. *Leaves* membranous, oblanceolate or oblanceolate-oblong, shortly and bluntly acuminate, the base much narrowed; midrib prominent beneath, the 5 or 6 pairs of curving spreading main nerves obscure on both surfaces; length 3 to 4·5 in., breadth 1·25 to 1·5 in., petiole ·6 to ·75 in. *Panicles* terminal, umbellately cymose, spreading, many-flowered, 1·5 to 2·5 in. in diam.; bracts minute, deciduous. *Pedicels* ·15 to ·25 in. long, filiform, ascending, lengthening in fruit. *Flowers* yellow, (or red?) ·3 in., in diam. *Calyx-lobes* broadly ovate, obtuse, puberulous. *Corolla* four times as long as the calyx, its tube short, the lobes deep, oblong, obtuse. *Stamens* as long as the corolla; the filaments slender, glabrous, the anthers elliptic. *Ovary* on a short thick stalk, oblong, glabrous, compressed, slightly furrowed, obtuse. *Fruit* 1·25 to 1·65 in. long, the calyx persistent at the base not quite so broad. *Seed* ·5 in. long: embryo much shorter than the albumen. Beccari, Malesia, I, 130; Miq. Fl. Ind. Bat. Suppl. 511.

Malacca; Maingay. Penang; Curtis, Nos. 835 and 1494. Perak; Wray, No. 3418. Singapore; Hullett, Nos. 3609 and 3610.

I have seen an authentic specimen of *Dodonæa Lamponga*, Miq. (Fl. Ind. Bat. Suppl. 511) and there can be no doubt that it belongs to this or to a closely allied species. It was collected by Teysmann in Eastern Sumatra. Beccari has described (Malesia, I, 130) a species (*P. longistyla*) from Borneo, which appears to differ from *P. malaccensis* by the length of its styles and the shortness of the filaments of its stamens.

## 22. CARDIOPTERIS, Wall.

Herbaceous, scandent, glabrous, the juice milky. *Leaves* alternate, long-petiolate, simple, palminerved. *Flowers* small, hermaphrodite regular, in axillary long sparse few-branched panicles. *Calyx* 5-partite, the lobes imbricate, persistent in the fruit, but very slightly accrescent. *Corolla* very deciduous, sub-campanulate, deeply 5-lobed, imbricate. *Stamens* attached to the short tube of the corolla and alternate with its lobes; filaments short, glabrous; anthers 2-celled, introrse, with vertical dehiscence. *Disk* none. *Pistil* free, cylindrical, slightly compressed, 1-celled: crowned by two stigmas, the one stipitate short and capitate, the other elongating after flowering. *Ovules* 2 (1 usually aborted), pendulous from the apex of the ovary. *Fruit* samaroid, obovate, oblong, emarginate at the apex; the nucleus narrow, elongate, prolonged laterally into membranous, horizontally striate wings and crowned by the columnar accrescent stigma. *Seed* solitary, pendulous, linear, sulcate, with thin testa,



fleshy granular albumen, and small conical embryo.—DISTRIB. A single Malayan species.

CARDIOPTERIS LOBATA, Wall. Cat. 8033 A, and in Benn. Pl. Jav. Rar. 246, t. 49. *Stems* twining, terete, striate, pale when dry. *Leaves* membranous, ovate-cordate, acuminate, more or less lobed, glabrous; main nerves 7 to 9, radiating from the apex of the petiole; length 2·25 to 5 in., breadth 1·5 to 2·75 in., petiole 2 to 5 in. long. *Panicles* 2 to 4 in. long, solitary, axillary, on long peduncles with a few long slender recurved few-flowered branches. *Flowers* distant, .1 in. long, on short puberulous pedicels. *Calyx* puberulous; corolla slightly longer than the calyx, pale. *Anthers* emarginate. *Fruit* .8 to 1·25 in. long, by .6 to .8 in. broad, the calyx persistent and very slightly accrescent. *Seed* sub-cylindric, compressed: Miq. Fl. Ind. Bat. I, Pt. 1, 799. H. Brongn. in Adansonia, X, 280: Baillon in DC. Prod. XVII, 26. *C. moluccana*, Blume, Rumphia, IV, 207. t. 177, f. 2. *C. javanica*, Blume l. c. III, 206, IV, t. 177. *Peripterygium quinquelobum*, Hassk. Cat. Pl. Hort. Bogor. 351. *Olus sanguinis*, Rumph. Herb. Amb. V, t. 482.

Perak: King's Collector.—DISTRIB. British India, Siam, Malayan Archipelago, New Guinea.

A widely distributed plant, varying considerably as to the form of its leaves. On these diversities of shape, four varieties have been founded.

The position of *Cardiopteris* has given rise to considerable discussion. Robert Brown was the first to suggest its affinity to *Phytocrene* and *Iodes*. By Wallich (its original founder) the genus was placed in *Sapindaceæ*; Hasskarl placed it in *Euphorbiaceæ*; and Blume regarded it as forming a separate family near *Boraginææ* and *Verbenaceæ*. There is no doubt that the gamopetalous character of the corolla and the absence of a disk are characters at variance with those of the majority of the species which are grouped in the family of *Olacineæ*; but the ovulation and structure of the fruit of *Cardiopteris* are quite unlike those of either of the gamopetalous families suggested as allies by Blume. The single character which, in my opinion, suggests a relationship with *Euphorbiaceæ* is the milky nature of the juice. The stamens and ovary, as Brown pointed out, are essentially those of *Iodes*, from which genus however this differs in calyx and in fruit. The genus with which, as it appears to me, there is by far the closest relationship is *Pteleocarpa*, Oliver. In fact the only characters which separate *Pteleocarpa* from *Cardiopteris* are that *Pteleocarpa* is a tree, while *Cardiopteris* is a scandent milky-juiced herb; and that *Pteleocarpa* has a 2-celled ovary and 2-celled fruit. And even this latter distinction is to a great extent neutralised by

the facts that, although there are two cells in the ovary of *Pteleocarpa*, there is only 1 ovule in each; and that both genera have two stigmas which are to some extent persistent in the fruit. The fruits of the two are strikingly alike, both being samaroid; and in this respect differing from all the other Asiatic genera which it has ever been proposed to include in *Olacineæ*. So great are the affinities of the two genera with each other, and so great their divergence from the other genera in the order, that I think they ought either to be separated as a tribe of *Olacineæ* or that the Natural family *Cardiopterideæ* first suggested by Blume, partially approved of by R. Brown, and adopted by Baillon, should be kept up, and that *Pteleocarpa* should be added to it.

#### ORDER XXX.—ILICINEÆ.

Shrubs or trees. *Leaves* alternate, simple, exstipulate, or with 2 minute stipules, usually coriaceous and evergreen. *Flowers* small, in axillary cymes fascicles or umbellules, usually dioecious; ♂ with imperfect ovary, and ♀ with imperfect stamens. *Calyx* 3–6-partite or -lobed; segments or lobes imbricate, persistent. *Petals* 4–5, rarely 6–8, connate at the base, or connate in the ♂ and free in the ♀, deciduous, imbricate. *Stamens* 4–5, adhering to the bases of the petals, sometimes free and hypogynous in the ♀: *filaments* subulate; *anthers* shortly oblong, dorsifixed. *Disk* 0. *Ovary* free, 3–16-celled; *style* 0, or very short, rarely long, stigma capitate or discoid; *ovules* 1, or 2 collateral, pendulous, raphe dorsal, micropyle superior, funicle often cupular. *Drupe* with 2 or more 1-seeded, free, rarely connate stones. *Seed* with a membranous testa, fleshy albumen and minute embryo.—DISTRIB. Three genera, and about 220 species, chiefly tropical.

##### 1. ILEX, Linn.

*Calyx* 4–5-lobed or -parted. *Corolla* with petals free or connate at the base and rotate. *Stamens* 4–5, adhering to the base of the corolla in the ♂, sometimes hypogynous in the ♀. *Ovary* 2–12-celled; *styles* 0 or very short, stigmas free or confluent on the top of the ovary. *Drupe* globose, very rarely ovoid, with 2–16 stones.—DISTRIB. Of the Order; species about 220.

Flowers of both sexes in simple axillary

racemes ... 1. *I. spicata*.

Flowers in axillary fascicles.

Pyrenes 6 or 7

Leaves very obtuse, entire ... 2. *I. epiphytica*.

Pyrenes 4

Leaves acute, serrulate ... 3. *I. Griffithii*.



Leaves shortly acuminate, entire	...	4.	<i>I. glomerata</i> .
Flowers of both sexes in branched pedunculate cymes.			
Pyrenes 4 to 6 ; nerves of leaves 10 to 12 pairs	...	5.	<i>I. Maingayi</i> .
Pyrenes 8			
Cymes dense, capituliform ; nerves of leaves 7 or 8 pairs	...	6.	<i>I. macrophylla</i> .
Cymes branched, often paniculate, rather lax ; nerves of leaves 6 to 8 pairs	...	7.	<i>I. cymosa</i> .
Imperfectly known	...	8.	<i>I. sclerophylla</i> .

1. *ILEX SPICATA*, Bl. Bijdr. 1149. A glabrous shrub (sometimes epiphytal, *fide* Blume) ; young branches rather stout, pale, glabrous. *Leaves* coriaceous, elliptic, shortly and abruptly caudate-acuminate, the base rounded or slightly cuneate ; the midrib stout, prominent beneath, depressed above ; main nerves 7 to 12 pairs, faint, spreading (not much more prominent than the secondary) straight, interarching within the edge ; length 3·5 to 6 in., breadth 1·5 to 2 in., petiole ·2 in. *Racemes* solitary or in pairs, axillary, ·75 to 1·5 in. long, sub-erect or spreading, puberulous, the bracts minute, pedicels 1 in. long. *Flowers* shorter than the pedicels. *Calyx* rather flat, with 4 or 5 broad rounded lobes. *Petals* broadly oblong, united at the base, finally reflexed. *Stamens* as many as the petals, inserted at their edges near the base ; *filaments* longer than the corolla, *anthers* small. *Female flowers* like the male, but the petals and stamens smaller. *Ovary* broadly ovoid, compressed, 16-celled ; the stigma large, sessile, elongate. *Drupe* ·15 in. long, broadly ovoid, compressed, the stigma persistent ; *pyrenes* 10 to 16, compressed. Hook. fil. Fl. Br. Ind. I, 598. *Prinos spicata*, Miq. Fl. Ind. Bat., I, Pt. 2, 594.

Malacca : Maingay (Kew Distrib.), No. 390. Perak : King's Collector, No. 2463.—DISTRIB. Java, (?) Borneo, Sumatra.

A species readily distinguished by its compressed fruit which has moreover many pyrenes (from 10 to 16).

2. *Ilex epiphytica*, King, n. sp. A small glabrous epiphytic shrub ; young branches rather stout, pale brown, striate. *Leaves* coriaceous, oval or elliptic, sometimes sub-obovate, very obtuse, the edges entire recurved when dry, the base slightly narrowed ; main nerves 5 or 6 pairs, rather straight, spreading, not prominent ; length 2 to 2·75 in., breadth 1 to 1·35 in., petiole ·15 in., stout. *Female flowers* in axillary fascicles of 5 to 7, ·15 in. in diam., their pedicels ·15 in. long. *Calyx* with 5 to 7 broadly ovate concave obtuse imbricate teeth, puberulous at the edges. *Petals* 6, oblong, sub-obtuse, longer than the calyx, free, nearly equal, imbricate. *Ovary* broadly ovoid, tapering to the very short style,

6- or 7-celled; *stigma* discoid, dotted in the middle. *Drupe* ovoid, .2 to .25 in. long, crowned by the persistent style and stigma; *pyrenes* 6 or 7, trigonous. *Male flowers* not known.

Perak; at elevations of about 5,000 feet, Wray, No. 3811; King's Collector, No 7413.

3. *ILEX GRIFFITHII*, Hook. fil. Fl. Br. Ind. I, 601. A bush or small tree; young branches stout, pubescent or glabrescent. *Leaves* coriaceous, elliptic, rarely elliptic-rotund, acute, the edges serrulate, the base slightly narrowed; upper surface glabrous, except the depressed puberulous midrib; lower surface puberulous or glabrescent, the midrib prominent and pubescent; main nerves about 8 pairs, spreading, inter-arching far from the edge; length 1 to 2.5 in., breadth .5 to 1.3 in., petiole .15 to .25 in. *Flowers* 4-merous; the males fascicled, less than .2 in. in diam., on pedicels longer than themselves. *Female flowers* larger than the males, in smaller fascicles, and sometimes solitary. *Calyx* a shallow cup, with 4 broad shallow ciliolate lobes. *Petals* broadly oblong, obtuse, finally re-curved, connate near the base. *Ovary* globose; *stigma* sessile, 4-lobed. *Drupe* globose or ovoid-globose, glabrous or glabrescent, .15 in. in diam., the pulp scanty; *pyrenes* 4, coriaceous, rounded at the back; *pedicel* .35 to .6 in. long.

Malacca: Griffith, Maingay. Perak: Wray, King's Collector.—  
DISTRIB.: Sumatra, Java, Khasia Hills and Cachar, Assam.

4. *ILEX GLOMERATA*, King, n. sp. A glabrous shrub or small tree; young branches, slender, dark-coloured. *Leaves* thinly coriaceous, oblong or elliptic-oblong, acuminate, the edges entire slightly wavy and recurved when dry, the base cuneate; main nerves 6 or 7 pairs, curving, ascending, forking, obsolete on the upper, faint on the lower surface; length 3 to 4.5 in., breadth 1.3 to 1.75 in., petiole .3 to .4 in. *Male flowers* .2 in. in diam., in axillary fascicles of 6 to 12, their pedicels .15 in. long. *Calyx* minute, with 4 shallow rounded teeth. *Petals* 4, very much longer than the calyx, broadly ovate, membranous, slightly coherent by their bases, hypogynous. *Stamens* alternate with and longer than the petals, slightly adherent to them at the base; *filaments* subulate, much longer than the broad shortly ovoid suturally dehiscent anthers; *Rudimentary ovary* ovoid, compressed, *stigma* sessile. *Female flowers* not known. *Drupe*s globular, .3 or .35 in. in diam., the pulp copious; *pyrenes* 4, trigonous.

Perak: King's Collector, Curtis, No. 2091, Scortechini.

5. *ILEX MAINGAYI*, Hook. fil. Fl. Br. Ind. I, 605. A glabrous tree 20 to 30 feet high (60 to 80 *vide* Kunstler); young branches stout, lenticellate, dark-coloured. *Leaves* coriaceous, elliptic, narrowly elliptic-oblong or oblanceolate-oblong, sub-acuminate, the base narrowed; upper



surface shining, the lower dull and sub-glaucous; main nerves 10 or 12 pairs, sub-horizontal, faint on the lower, obsolete on the upper surface; length 4 to 5·5 in., breadth 1·35 to 2 in., petiole ·4 to ·65 in. *Male flowers* in pedicelled sub-umbellulate sub-racemose cymes about 1·25 in. long; the buds globular, less than ·1 in. in diam. *Calyx lobes* 4 in the male, 6 in the female, rounded, not ciliate. *Petals in the male* 4, broadly oblong; *stamens* longer than the petals and attached to their bases. *Female flowers* in short racemes; *petals* and *stamens* 6, hypogynous. *Ripe drupes* ovoid or globular, ·2 to ·25 in. in diam., grooved when dry; *pedicels* stout, as long as the drupes, pulp scanty; *pyrenes* 4 to 6, trigonous, thickly coriaceous; *stigma* sessile, swollen.

Penang, Maingay; (Kew Distrib.), No. 1021; Curtis, No. 2152. Perak; Scortechini, King's Collector.

6. *ILEX MACROPHYLLA*, Wall. Cat. 4331. A tree 15 to 30 feet high; young branches stout, pale, sometimes lenticellate. *Leaves* coriaceous, elliptic to elliptic-oblong, obtuse or sub-acute, entire, the base slightly narrowed; upper surface shining with the midrib depressed and the nerves obsolete; the lower dull, the 12 pairs of spreading nerves slightly prominent and interarching freely at some distance from the edge; length 4 to 6 in., breadth 2 to 2·5 in., petiole about ·5 in. *Cymes* dense, capituliform, often branching; their pedicels slender, axillary, longer than the petioles. *Flowers* ·15 in. in diam., 4-6-merous. *Calyx* with broad deep teeth. *Petals* broadly oblong, obtuse in the male flowers, united at the base; in the females, free and sub-equal. *Stamens* longer than the corolla and inserted on it. *Drupes* sub-globular, ·2 in. in diam., the *stigma* permanent and prominent; *pyrenes* about 8, trigonous.

Penang: Phillips, Wallich, Curtis, King's Collector. Malacca: Griffith, Maingay. Singapore: Ridley.

7. *ILEX CYMOSA*, Blume Bijdr. 1149. A glabrous tree 15 to 40 feet high; young branches slender, very pale. *Leaves* thinly coriaceous, elliptic-oblong to elliptic, the apex often shortly and bluntly acuminate, the base slightly narrowed or rounded, lower surface slightly glaucous; main nerves about 6 to 8 pairs, curved, ascending: length 2·5 to 4·5 in., breadth 1·35 to 2·5 in., petiole ·25 to ·35 in. *Cymes* solitary, pedunculate, branched and often paniculate, spreading, many-flowered, rather lax. *Flowers* ·1 in. in diam.; their pedicels slender, ·25 in. long. *Male flowers* 4-5-merous; the calyx lobes broad, rounded, ciliolate; *petals* broadly obtuse, about as long as the stamens. *Female flowers* with 5-6-merous calyx, and 6 to 8 short erect free concave slightly unequal petals; *ovary* globular-pyramidal; *style* short, thick; *stigma* large, hemispheric. *Drupes* globular, ovoid, crowned by the persistent style and stigma,

grooved when dry; the pulp scanty; *pyrenes* about 8, trigonous. Hook. fil. Fl. Br. Ind. I. 605. *I. singaporiana*, Wall. Cat. 6526. *Prinos cymosa*, Hassk. Tijdschr. Nat. Gesch. X, 140: Miq. Fl. Ind. Bat. I, pt. 2, 595. *Leucodermis javanica*, Planch. MSS.

In all the provinces except the Andaman and Nicobar Islands: common.—DISTRIB,—Sumatra, Java, Borneo, and probably in other islands of the Malayan Archipelago.

The short thick style is in the ovary often obscured by the stigma, but in the ripe fruit it is very apparent.

8. *ILEX SCLEROPHYLLA*, Hook. fil. Fl. Br. Ind. I, 606. *Leaves* thickly coriaceous, elliptic-oblong, obtuse, the edges entire, narrowed at the base into the very thick petiole; upper surface shining, the lower glaucous; length 5 or 6 in., petiole .5 in. *Female cymes* 1 in. long, sparingly branched, the peduncle very stout, the branches apparently 3-flowered; the pedicels stout, .25 in. long. *Calyx* with 5 rounded ciliolate lobes. *Petals* minute, free, unequal. *Ovary* ovoid, truncate, *stigma* sessile.

Malacca, on Mount Ophir: Griffith, No. 5013.

I have seen no specimens of this except Griffith's which is at Kew, and the above description is largely copied from Sir Joseph Hooker.

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*Description of a New Lathraea from the Eastern Himalaya.*—By SURGEON CAPTAIN H. A. CUMMINS, *Army Medical Staff.*

[Read, 6th Feb.]

During an expedition to the Dichu Valley in August, 1893, a species of *Lathraea* was found growing in black soil in dense bamboo jungle. The connection with the roots of the bamboo (*Arundinaria aristata* Gamble) was not made out, but there was no other plant except this bamboo in its neighbourhood. The specimens could not be matched in the Calcutta Herbarium by Dr. King, Dr. Prain, or myself. Dr. Prain and I have since examined the material of *Lathraea* in the Kew Herbarium and have come to the conclusion that the specimens represent a very distinct new species most nearly related to *Lathraea clandestina* Linn. The systematic description of the new species is as follows:

*LATHRAEA* (§ *Clandestina*) *PURPUREA* Cummins; diffusa laxius ramosa, caulibus purpureis brevibus (3—4-unc.) gracilibus squamosis; squamis purpureis orbicularibus obtusis oppositis breviter petiolatis; floribus racemosis longiuscule pedicellatis, strictis, erectis; bracteis squamis caulinis conformibus sub-sessilibus; calyce cylindrico-campanulato hirsuto, 10-costato, indistincte 2-labiato, purpureo; corollae tubo pur-